

ARCHITECTURE

THE PROFESSIONAL ARCHITECTURAL MONTHLY

VOL. XL

JULY, 1919

No. 1



To encourage and control the physical and economic growth of the rapidly developing city a complete new city plan has been created.

A Notable Civic Development at Three Rivers, Province of Quebec

A Municipal Expansion Project Involving Important Features of Architectural and Engineering Design, City Planning, and Harbor Development

ONE of the interesting features of the reconstruction period is the increased interest on the part of city officials toward the establishment of their municipalities on the sound basis of large business institutions. The increase in cost of municipal maintenance has made it necessary not only to develop present sources of municipal income along intensive lines but to determine new sources of municipal revenue to aid in carrying the burden of administration and to keep the general tax rate on as normal a basis as may be possible.

The fact is gradually becoming more clearly recognized that municipal expansion can be developed only through the application of modern methods to city business. After the preliminary stages industrial expansion cannot take place without civic expansion. The problem of labor is not only a question of wage scale but embraces the important factors of good housing conditions and the provision of various necessary community facilities. It is therefore evident that industrial expansion is not induced by the provision of manufacturing facilities alone but is encouraged by the development of those facilities which render a community an attractive place in which to establish a home.

Probably the best current example of civic development along these lines is found in the city of Three Rivers (Trois Rivières), in the province of Quebec, Canada. Here, under the direction of Mann & MacNeille, architects, engineers, and municipal developers, of New York City, various projects are being carried out for city officials and private owners involving interesting problems of architecture, engineering, industrial housing, and city planning as well as various questions of harbor development.

The history of the development of Canadian cities shows three clearly defined aspects of civic growth. The first type of development is that of the slow expansion of old cities which have gradually developed from pioneer settlements over a period of centuries. Such, for instance, has been the growth of Quebec. The second type of development is that of the conservative, modernized growth resulting from the application of sound business principles to the development of a city having the natural advantages of good geographical location. Montreal exemplifies this type of development. The third type includes the so-called boom cities which have grown as natural centres in widely exploited and rapidly

colonized districts where the sudden opening of vast quantities of natural wealth in the form of mineral deposits or undeveloped agricultural resources has brought about rapid colonization.

The city of Three Rivers, located at the confluence of the St. Lawrence and St. Maurice Rivers, midway between

point of this great section, is to be the centre of a more conservative but nevertheless extensive expansion in the near future.

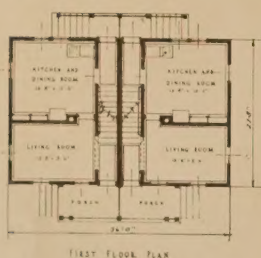
The present city, having a population of approximately 25,000 persons (French, English, and American), has expanded to fill the terrain located between the angle of the two rivers and the high land to the north. The industries of the city, including extensive shipyards, six large lumber-mills, two cotton-mills (one having a spindle capacity of 75,000), and one pulp-mill (producing 60,000 tons of pulp and Kraft paper yearly), are located along both river-fronts. Other industries are located directly across the St. Maurice.

The business section of the city, including a number of stores, office buildings, and banks, extends for several blocks along the Rue des Forges in the centre of the city. Among the public buildings may be mentioned the large new post-office, city hall, schools, cathedrals, various community buildings, and several small hotels, while the remaining area of the developed section of the city is taken up with residential properties, many of them old buildings, many of which have outlived their usefulness.

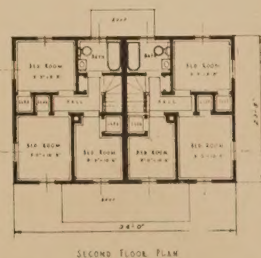
As no accurate map of the city of Three Rivers existed at the time this survey was undertaken, the first work by the town planners was to provide such a map, giving accurate street locations, lines of transportation, parks, public and semi-public buildings, and other general information necessary for a comprehensive city map. By the use of existing data and through investigation, complete information for this map was collected and correlated. The final map was then prepared and a number of copies were furnished for the use of the city engineer, city officials, and others interested.

A study of the present city map shows the governing elements in the growth of this city to have been the topography, the highway from Quebec to Montreal paralleling the St. Lawrence, the Canadian Pacific Railroad, and the Côteaux (plateau back of present city). Except at some few points the plan of the existing city is good, making natural expansion easy rather than limiting it.

The water-front along the St. Maurice River has wisely



FIRST FLOOR PLAN



SECOND FLOOR PLAN

Type of double 5-room house for development of National Shipbuilding Co.

Montreal and Quebec, is unique in that its recent growth and the extensive expansion which is undoubtedly to occur within the next few years is due to the application of all the forces of development which have brought about the establishment of the best cities of Canada.

During the past ten years the interest of far-sighted business men has been directed to the natural geographical advantages of this city, with the result that a number of industries have been established on a large scale and the city during that period has doubled in population.

In addition to this Three Rivers is the centre of a great, partially developed section of Canada, rich in natural resources, which during the past years has been overlooked for the more glittering promises of central and northwestern Canada. Popular interest is now returning to the eastern part of Canada, and Three Rivers, as a natural distributing



Three Rivers is noted for its many interesting ecclesiastical buildings.

been made available for industrial purposes to a sufficient distance from the river-banks, with the result that it has been disposed of to the advantage of the city. The experience gained in this section will influence the authorities to take full advantage of the St. Lawrence River frontage, where even greater existing natural advantages insure proportionately greater returns to the city. While the present streets limit this area unnecessarily, comparatively sim-

ple modifications secure the desired depth of river-front property.

Access to the Coteaux, while meeting present needs relatively well, is inadequate for the greater city, and the problem of railroad crossings will be given careful study when the location of the new railroad station is determined.

In analyzing the plan of Three Rivers and the territories

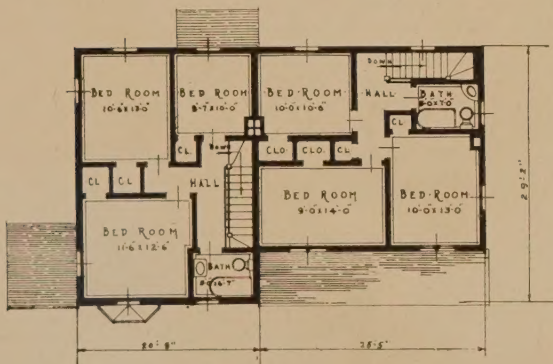
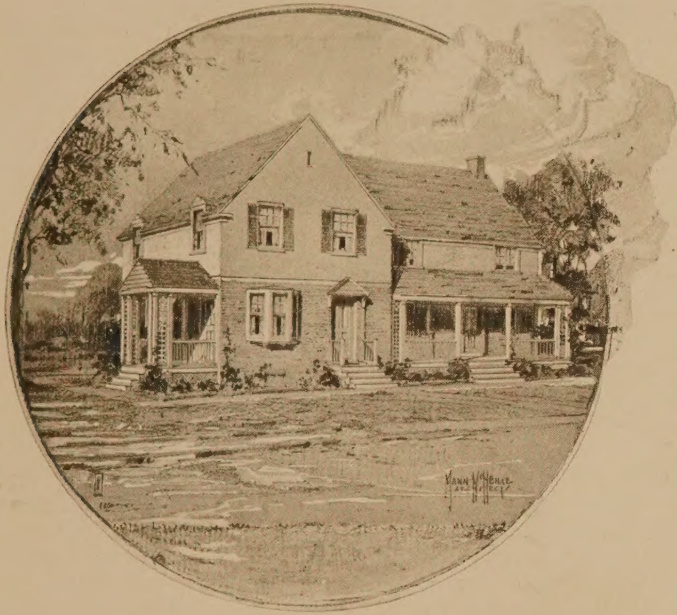
beyond those now built up, it was found that not only because of its natural advantages and beautiful location is Three Rivers full of interest, but in some of the old buildings, as shown in the accompanying illustrations, much of quaintness reflects the early origin of the city and the architectural merit and substantial character of the buildings of France.

Reminiscent of the picturesque French cities are the narrow streets, old houses with their steep-pitched roofs, picturesque dormers, quaint doorways, and porte-cochères leading to yards suggestive of holding more of interest beyond. A pleasant surprise awaits the traveller at the Carré Champlain, where are brought together the religious and civic activities of the city, for on one side is found the beautiful cathedral with its contributory buildings for benevolent and educational work, as well as the home of the bishop and his coworkers, and opposite is the Hôtel de Ville, containing the offices of the various departments and of his honor the mayor.

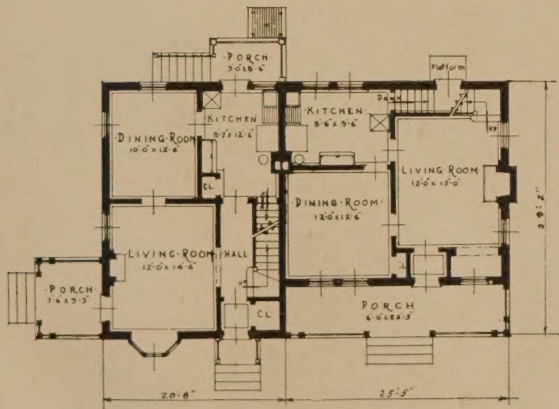
The main business street of the city, into which many of the residential streets lead, is developed in a more modern way, with an atmosphere of purpose and activity thoroughly in keeping with such districts. The office buildings are substantial, being equipped with up-to-date improvements. The various bank buildings here found are conspicuous examples attesting to the sound financial foundation upon which business is built and offering guarantees of efficient co-operation to those planning new enterprises.

The new city plan as prepared by Mann & MacNeille (study of which is shown on the first page of this article) is divided into three aspects. First, logical and economical changes in existing street conditions in order to provide a better flow of traffic; second, a layout for the medium-class residential development which may ultimately be expected toward the west at such time as industries take up the land along the bank of the St. Lawrence; and, lastly, a general indication of the main thoroughfares on the Coteaux, at which point the more permanent high-class development of the city may be expected.

It must be understood that there is still much vacant

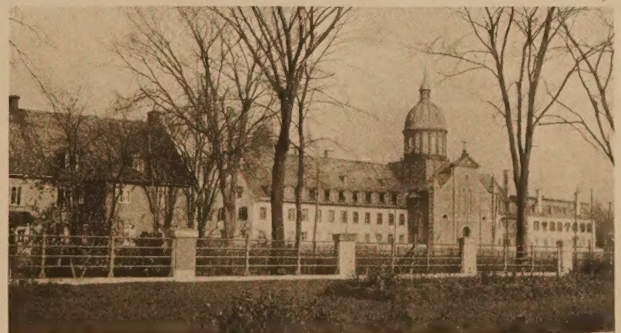


SECOND FLOOR PLAN



FIRST FLOOR PLAN

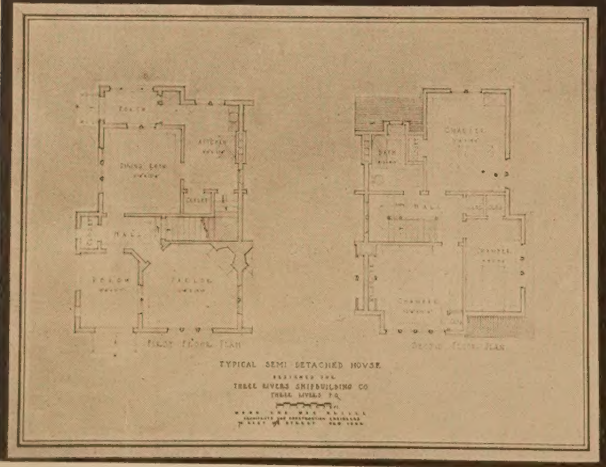
An unusual type of double 6-room house having all advantages of the individual dwelling.



An example of interesting old architecture at Three Rivers.

land within the built-up portion of the city which is available for industrial, business, and residential development, and in the manner of the cities of Canada, particularly those having a high percentage of French population, it may be expected that this intensive development will be the first to take place, except in such sections where the location of industries may demand industrial housing projects and contributory activities near at hand. The city plan gives in detail the recommended location of main streets and highway system, covering the logical territory for the expansion of the city to a population of at least one hundred thousand.

It must be realized that city planning should not be approached entirely from the view-point of the city beautiful. It is not difficult to provide a plan which affords an attractive picture, but the object to be achieved is a city plan which will be more than a wall decoration. It is the purpose of the new plan to establish definite lines along which the growth of the city shall be controlled in order

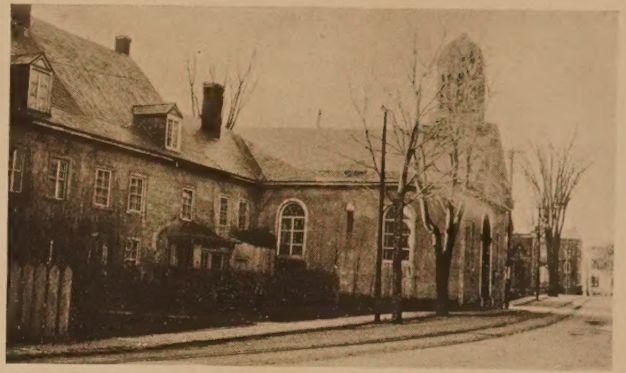


Many of the new semi-detached houses are to be of unusual type.

that the greater city of Three Rivers may enjoy the many economic and social advantages of a well-planned community.

An important feature in the new city plan is a zoning system which enforces the placing of certain classes of buildings and building occupancies in certain districts. For instance, all factories must be placed in the factory zone; but this does not exclude residences, business buildings, hotels, or buildings of any nature. Similarly, in the business district no factories can be placed, as they must be confined to the factory zone, but residences or any type of building except factories may be placed in this district. In the residential district factories or business buildings are prohibited as locations have already been allotted for such buildings in the zoning system.

Provision has been made for exceptions to the zoning system and details of such exception and method of having property exempted from regulations are found in the new building code which has been prepared for the city by Mann & MacNeille.



Gracefully curving street vistas which are characteristic of this old French Canadian city.

Four principal zones have been defined on the new city plan as follows:

- 1—The business zone,
- 2—The factory zone,
- 3—The residential zone,
- 4—The city water-front,

to which may be added the various parks and playgrounds with the parkways connecting them and forming one continuous park system.

While the city plan and municipal expansion features were being worked out, another project was being carried on by the same architects. This project involved the development of a large tract of land for industrial housing for the employees of the Three Rivers Shipyards, Ltd. (National Shipbuilding Company). This necessitated the laying out of a tract of land comprising over one thousand lots and the design and location of various classes of houses suitable for the climate and type of workmen employed at the plant. Several of the house designs are shown in connection with this article, and the layout of this section of the land is illustrated on page 190.

The engineering problems involved in the development of this residential addition include street grading and paving,



The domestic architecture bears the ineradicable imprint of the French Renaissance.

water supply, sanitary and storm-water sewers. A short discussion of this subject will give the reader an idea of the difficulties to be overcome.

This problem was particularly interesting owing to the fact that the terrain upon which the city is located is low river bottom-land, common to both banks of the St. Lawrence River in this locality, and presents interesting geological features in that the various stages of the river's recession can be traced with ease. At distances varying from one-half to one and one-half miles from the river bank run a



One of the beautiful churches of Three Rivers.

series of terraces. The first is approximately thirty-five feet high, with a plain of about six to seven hundred feet in width to the foot of the second terrace, which averages twenty feet in height, with a plain of about a quarter of a mile to the foot of the third terrace, which rises for fifteen feet, more or less, and then slopes upward to the foot-hills some distance away. The soil of the terraces is gravel and sand with about two feet of loam on the surface, while that of the river bottom-land is composed of a top strata of loam

and clay approximately one and one-half feet deep with an underlying strata five feet deep, composed of very fine sand and yellow clay, and a third strata of unknown depth of blue clay and sand.

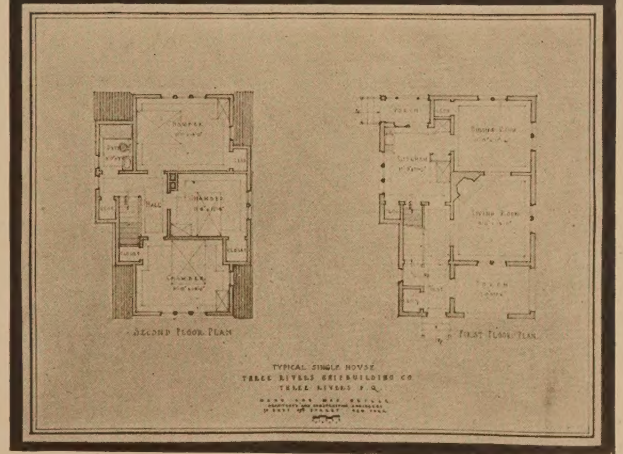
This latter strata forms a water-table about six feet below the surface which retains water more or less during the entire year, more so in the spring than at any other time. To drain this plain a series of parallel ditches have been dug, each approximately three feet deep by six feet wide and about five hundred feet apart, running from the terrace to the river, and these ditches also mark the farm-property lines.

The first development in the general scheme of Greater Three Rivers is this residential section for employees of the Three Rivers Shipyards, Ltd., of the National Shipbuilding Company, a tract of one hundred and forty-three acres situated about a mile to the south of the



The city officials will preserve these characteristic and attractive sections.

main business section of the present city and lying between the track of the Canadian Pacific Railroad and the St. Lawrence River. The elevation of the land ranges between fifteen and seventeen feet above mean low water, having a slope toward the river of two feet in two thousand feet. This comparatively level surface is ideal for the street and water-



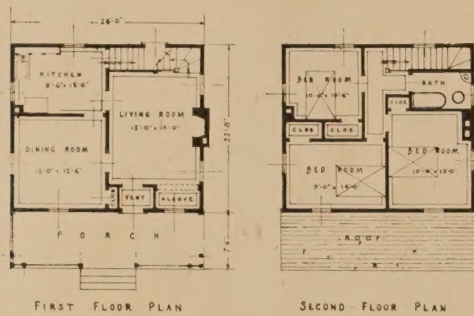
Moderate-cost homes for industrial workers will offer a valuable contribution to city growth

supply systems but creates a definite though not difficult engineering problem in the installation of sewerage systems, as the flat street grades necessitate deep ditching so as to obtain the necessary grades for properly draining the sewers.

The design of the sanitary sewer system has been made to meet the following conditions:

- 1—Perfect sanitary drainage of all houses on the property when fully developed.
- 2—Separate system from that of storm sewers.
- 3—Separate system from that of the city of Three Rivers.

In the first condition the following assumptions have been provided for: The streets being fairly well paved and a separate storm-water sewer being provided, there will be very little opportunity for drainage water to find its way into the sanitary sewers, therefore the sewers have been designed to receive an amount of water equal to the total average daily consumption of the population. In this case the per-capita consumption has been taken at 100 gallons, equal to the per-capita consumption of the city of Three



FIRST FLOOR PLAN SECOND FLOOR PLAN
A six-room house for the new residential development.

Rivers. As the total population of this development has been estimated to be 6,500, then the daily consumption will be 650,000 gallons, which is equal to the total sewer discharge per twenty-four hours, or 8 gallons per second.

The second conditions were decided upon because of the additional expense incurred in combining a sanitary and storm-water sewer into one system, owing to the increased size of all mains, and also the necessity of carrying the large cutfall mains (36 inches in diameter) to the river. In the separate system, as designed, only one pipe 18 inches in diameter is carried to the river. The difference in cost between one 18-inch diameter pipe and two pipes 36 inches in diameter, which would be necessary to carry off the storm water, is more than enough to purchase the material for the entire sanitary systems. Therefore the advisability of designing the separate systems is obvious.

The third condition arising from the fact that the grades of the proposed sewers are so much lower than the grades of the existing city sewers, it was not practical to connect the two systems unless a pumping-station were provided for that purpose. As this would be a waste of funds without gaining any advantage, it was decided to discharge directly from the property into the St. Lawrence River.

The storm-water sewer system for the new development was then designed to carry off all surface water due to rain

and snow, based upon the average maximum rainfall of one and one-half inches per hour in the vicinity of Three Rivers. The amount of water in the existing ditches crossing the property has also been taken into consideration as indicating the surface flow from the foot-hills, and the design has been governed accordingly. This latter feature of the problem necessitated larger sewers than would otherwise be needed.

Two schemes were designed for the disposal of this water, and the merits for each one will be discussed, together with the reasons for selecting the plan submitted. For clearness of discussion we will call the schemes A and B.

Scheme A was designed with three main intercepting sewers, along roads H, M, and S (see illustration on page 190), respectively, and these in turn discharging into one trunk sewer along road G, which in turn was carried along the continuation of road H, finally discharging into the river. For proper drainage it was necessary to so grade the sewers that the flow line of the 42-inch trunk sewer was below the foundations of the stone arch culvert at Notre Dame Street. In the construction of this sewer these foundations would be disturbed, necessitating underpinning, which would add materially to the cost. On the other hand, if this trunk sewer was omitted from road G to the river a great ditch would be formed at the stone arch culvert which in time would be undermined by the action of the water.

Scheme B, on the other hand, a study of the contour of the land, will show that it is possible to carry the water off in two directions, east and west, and this scheme has finally been adopted. Intercepting sewers will be located along roads H and S. These sewers will discharge into existing open ditches, which will be deepened to the grade of the sewer, from points 50 feet south of road G on the continuation of roads H and S and carried at grade to the river.

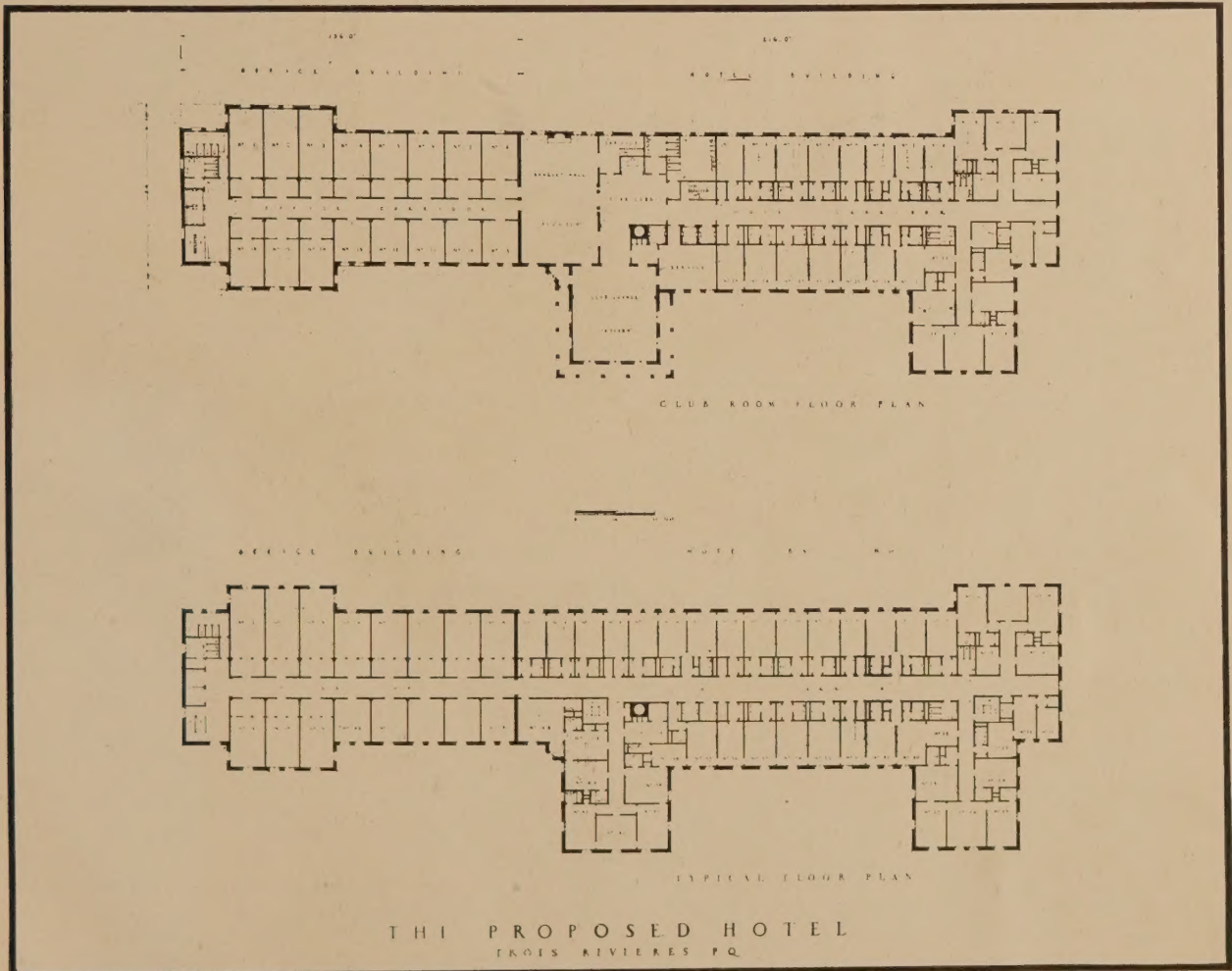
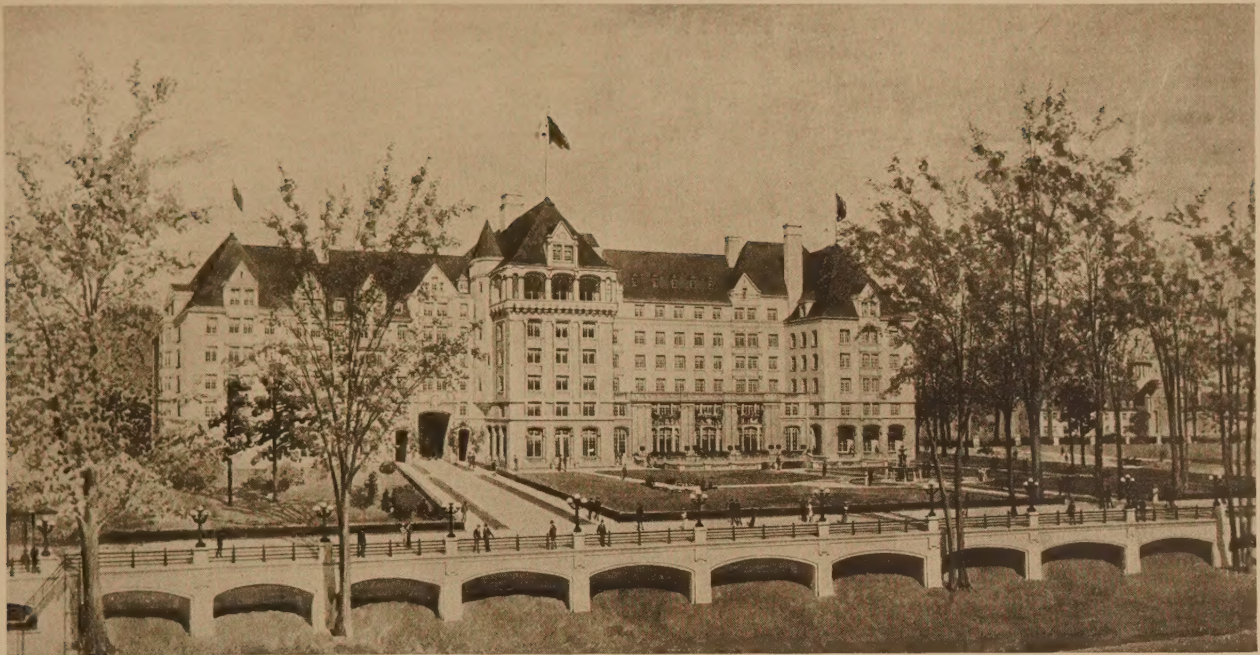
It is also intended, where open ditches cross the existing city streets, to construct a section of sewer at grade so that the street may be carried over the ditch.

The design of the water-supply system has been based upon the following assumptions:

- 1—The city of Three Rivers is to deliver a constant supply of water in sufficient volume to 10-inch main on the property so as to maintain an average static pressure of 50 pounds per square inch throughout the year.
- 2—All mains, valves, and hydrants have been designed to meet the above pressure.



The atmosphere of vesper-bells.



Mann & MacNeille, Architects and Engineers.

THE CHARACTERISTICS OF LOCAL ARCHITECTURE ARE COMBINED WITH EFFICIENCY OF PLANNING IN THIS DESIGN FOR A TOURIST-COMMERCIAL HOTEL AT THREE RIVERS, P. Q., CANADA.

3—Fire-hydrants have been so placed that any point throughout the development is within a radius of 250 feet of the nearest hydrant, which complies with the best practice on fire protection.

4—The same system of mains has been designed to supply the houses as well as for fire protection.

In accordance with the new city plan of Three Rivers, it will be seen that the street systems of the present city and

ing developments where no city plan was available to guide the developer.

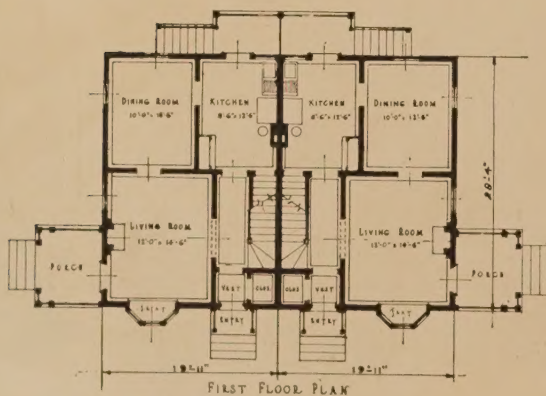
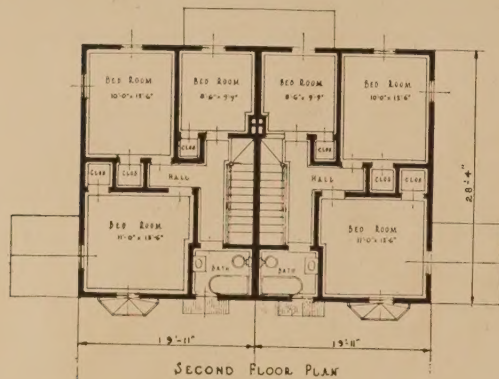
Some of the main business streets of Three Rivers are paved with concrete. These were laid about two and one-half years ago and are in excellent condition to-day, but the majority of the city streets are paved with treated macadam, and this class of road pavement will be used throughout the new development, and all sidewalks, curbs, and gutters will be of cement.

In view of the need in this rapidly growing city for a tourist and commercial hotel, Mann & MacNeille have designed a modern fireproof hotel, to cost approximately \$1,000,000, and to be erected at a feasible point in the city.

The type of construction will depend upon the season of the year in which work is started. If the construction work is begun in the early spring, then a reinforced concrete frame and floor slabs will be used, but if the work is not started until late summer or fall a skeleton of steel frame with terra-cotta floor slabs will be adopted. This alternate design is due to the weather conditions. The temperature during the winter averages 20° F. below zero. If, therefore, concrete work were started in midsummer or fall it could not be finished before this intense cold set in, and the progress of the work would have to be stopped. It was, therefore, decided to use structural steel as an alternative. The difference in cost between a reinforced concrete structure and one of steel was found in this instance to be in favor of concrete. This 10 per cent applies only to the cost of the framework and not to the cost of the completed building.

The architectural design of this hotel, as shown on page 187, is in keeping with the better types of local architecture—a modern adaptation of the French Renaissance. The floor plans of the hotel provide two hundred rooms and special space on the top floor for the City Club of Three Rivers.

These developments at Three Rivers constitute not only comprehensive architectural, engineering, and city-planning projects, but are indicative of the progressive spirit of the city officials. With commendable foresight they are laying a strong foundation for the rapid industrial expansion which may be expected in the next few years.

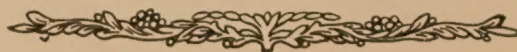


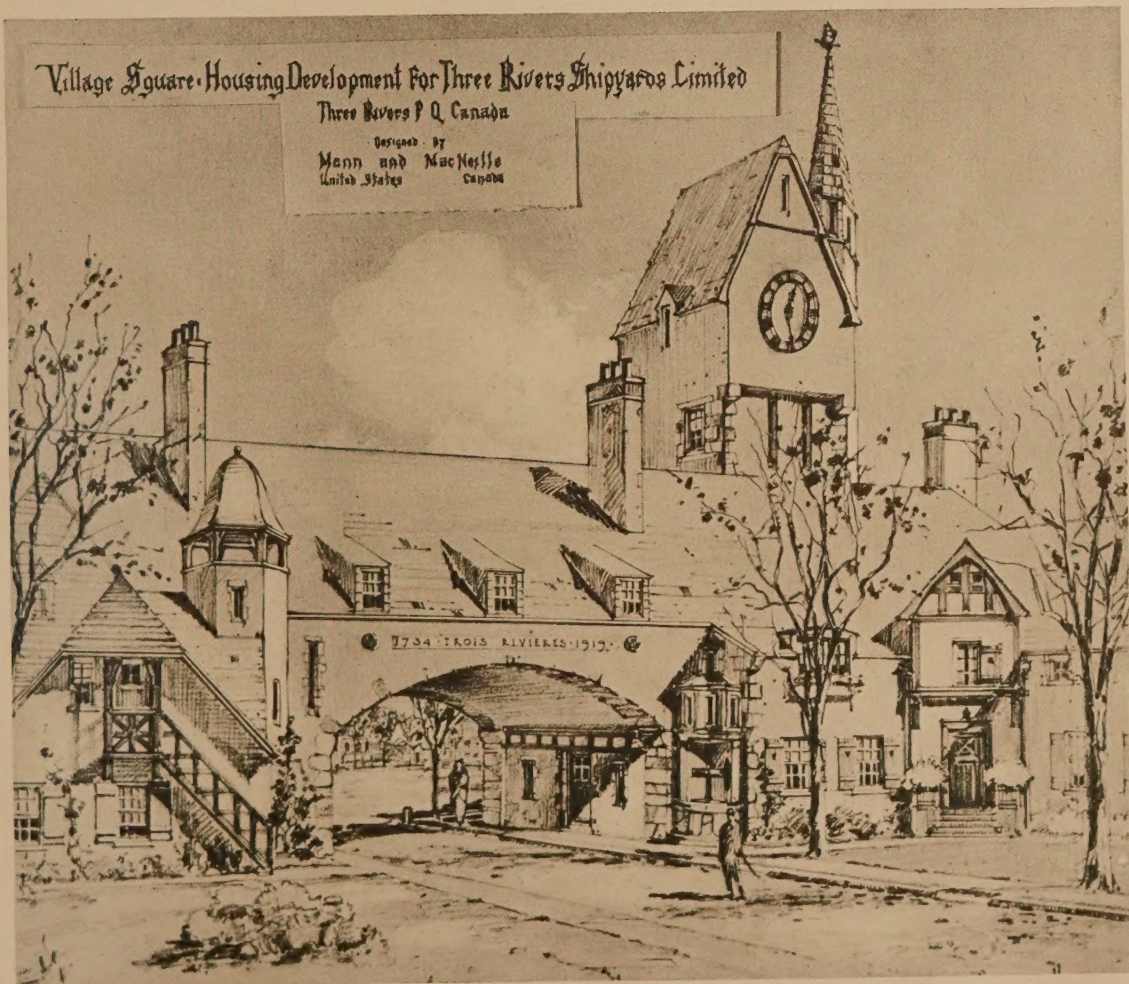
Another type of six-room semi-detached houses.

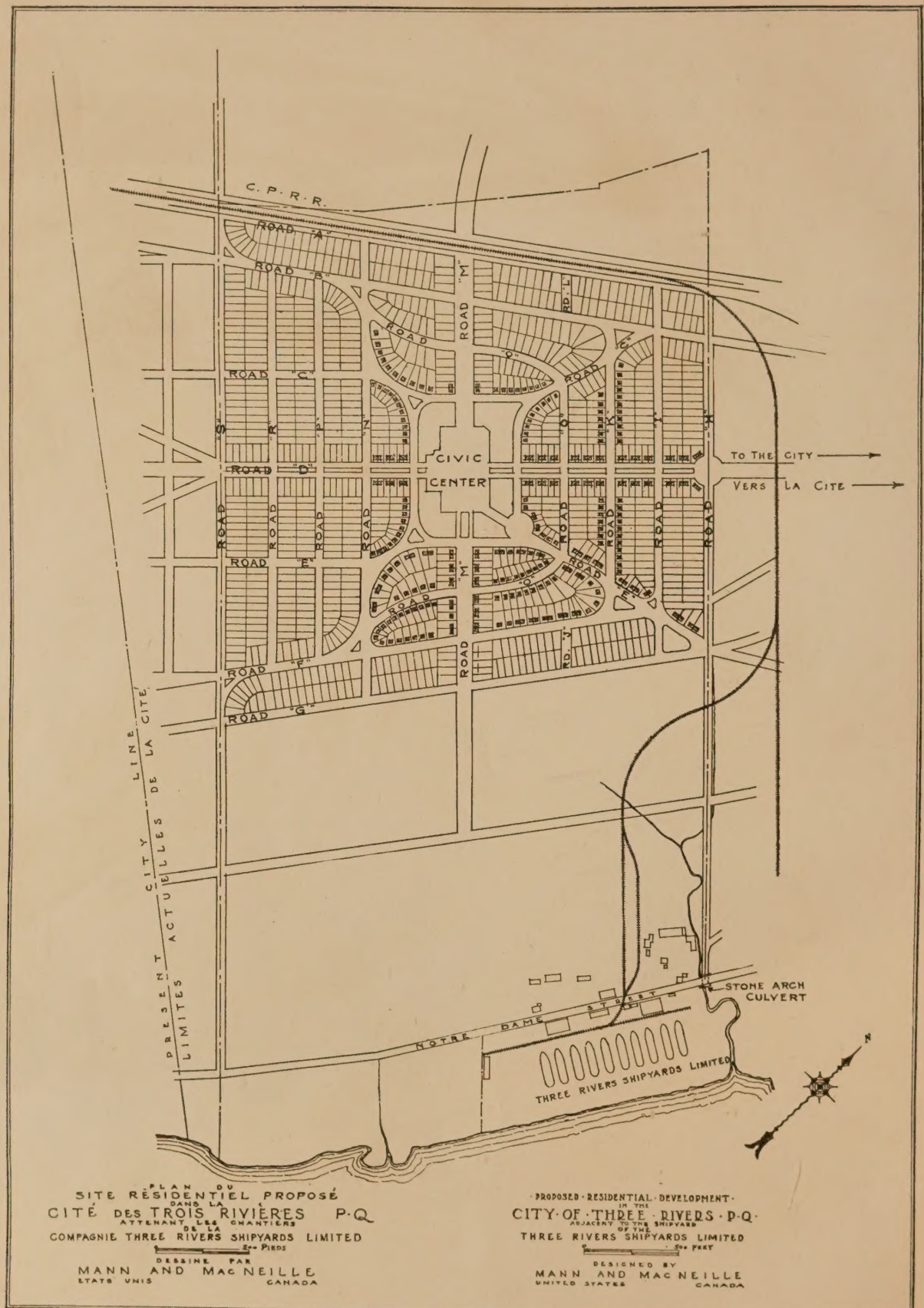


A historic house and a characteristic bit of French architecture.

that of the proposed development for the shipyard are connected in such a manner that the resulting effect is one of harmony instead of discord, as is often the case in new hous-







Editorial and Other Comment

Home Building a Natural Necessity

THE problem of housing is becoming more than a mere question of business expediency, of waiting for an impossible return to normal costs in labor and building material. It has become a national necessity. No one who has followed conditions, either in his own experience or through the reports published constantly in our newspapers, can fail to see that "build now" has become something more than a merely optimistic slogan to create business. The application of the law of the jungle, of supply and demand, to human beings who are seeking places to live in, the unlimited privileges seemingly granted to unscrupulous landlords, the squeezing from tenants regardless of all fairness, will, we believe, by the wide feeling of injustice it is creating, effect in time its own cure.

The prime thing is that time is pressing and that waiting only makes the matter more difficult. Capital naturally seeks advantageous opportunities for investment, and we believe that we have shown in several recent articles in ARCHITECTURE that both permanency and profit are to be found right now in well-directed building investments. There isn't a city in the country where there is not an immediate and urgent need of homes. Another annual rent boost menaces thousands this fall who are already paying more than they can afford for mere shelter, many of them living in shabby, ill-arranged, and out-of-date so-called "apartments."

There are the finest of opportunities presented in building large unit groups of small apartments for the very large class of poor but honest folks of the professional and semi-professional classes. The trouble with some of these enterprises in the past has been that beginning with honorable intentions they have ultimately yielded to the pressure of the law of supply and demand, and long since gone over to the get-rich-quick class.

Is it not possible for an "Own-Your-Own-Home" campaign to be fathered in the direction of these city apartments? It would be an easy matter to find many groups of fifty or one hundred home-seekers to invest, let us say, five or six thousand dollars each, in such an enterprise. Such an apartment if conducted with regard to the character, comfort, peace, and quiet of the tenants, would have no vacancies, no yearly doing over, none of the excess overhead due to irresponsible tenants, who, in the regular order of things, have been accustomed to make an annual pilgrimage in search of new quarters.

Far be it from our thoughts to imply here any element of philanthropy, of doing good, of uplift. No, let the law of supply and demand apply, but administer it with an idea of the conservation of human beings as well as the enduring profit of well-invested capital.

The demand for housing of to-day is, of course, abnormal. There probably has never been such congestion in the history of the country, for our city populations have grown faster than our building during the war period. The methods of many property owners are comparable only to those of legalized pirates or the commanders of the German submarines.

Progress has already been made toward interesting capital in present building, and the further the investigation is carried of present conditions, and the better the facts are known regarding present and future profits, the sooner this great question will be satisfactorily adjusted. The time for debate is over. Give us action lest the winter of our discontent find us unprepared.

In New York

THE conditions in New York City are by no means exceptional. We hear of a similar situation everywhere. New York is not leaving the solution to chance, however, or to merely speculative builders, who, if they have their way, will only add to the present intolerable conditions.

So serious has the housing shortage become in New York City that public-spirited citizens with expert knowledge are adding their suggestions to the surveys and plans made by the Mayor's Committee, the State Reconstruction Committee, and the joint Legislative Committee. How homes at reasonable rentals may be provided for wage-earners is the goal of these agencies, and one idea presented by a prominent citizen is that a fund of \$10,000,000 be provided for the purpose of building model houses, bankers, insurance representatives, and civic organizations co-operating to assure sanitary conditions, fair rentals, and general comfort for people of moderate means.

The space now occupied by rows of ramshackle tenements of the dark ages can everywhere be put to both a more wholesome and profitable use. There are many members of the profession all over the country who have studied the most economical planning of the tenement and small apartments in our cities, who can get value out of every foot of space and provide for the light and air demanded by intelligent and yet sanitary building laws. No one with the least vision can fail to see that the problem of building homes is a most vital one. The assurance of a fixed abode, and of a rental based on an equitable return to capital, will be the best of arguments against much of our growing social unrest.

We hear of the breaking down of old barriers, of a common humanity, of a sort of brotherly-love feast born of the mingling of men from all walks of life in our armies. But what we need is a new patriotism, not born of waving flags and jazzing bands, but of the sanest of clear thinking and clear seeing of actual conditions about us. We need plenty of idealism to keep us going, but the idealism of sound thinking, not of passing emotion.

Get Together

"BELIEVE and act upon the spirit of co-operation. If you have a problem that you know your experience does not justify you in assuming that you can successfully solve, call in your brother practitioner and ask his aid, and remember that there is no problem either in the art, science, or business of architecture that cannot be successfully solved by the men in your own society.

Don't regard your brother professional man as your enemy—think of him as your friend; ask his aid in solving your problem and he will ask your assistance with his own."

The Status of the Architect

An Address by Irving K. Pond, Past President of the A. I. A., at the Fifty-Second Annual Convention of the A. I. A., at Nashville, Tennessee

I AM asked by Chairman Medary to speak for a few moments on the topic: "The Status of the Architect: Art, Profession, or Business." If this is a question it was answered properly many decades ago for the Institute by *itself*. If it is a statement, the form is improper and should be: Art, Profession, *and* Business; a "Trinity" and withal a "Unity"; a paradox which, in another field, the dogmas of orthodox Christianity have forced many to accept, and many others to contemplate with more or less strained acquiescence, or with no emotion whatsoever. But perhaps in the architectural field it is not a paradox, but upon analysis will prove to be a clean-cut statement of fact. Under whatever phase it may be discussed, however, I am going to regard it all in the light of the words of old Polonius, whose advice holds just as good under post-war as it held under pre-war conditions, and it held with firm grip then. "Above all," he says, "above all, to thine own self be true; and it must follow, as the night the day, thou canst not then be false to any man." If the architect sincerely maintains that attitude the public will soon enough recognize him in and through it, and repose confidence in him as an artist, and as a professional man who with the ordered instinct of business co-ordinates his powers and faculties and accomplishments to the end of a deeper and richer personal and public service. "To thine own self be true"—and let post-war committees and a complaining public—if it exists—go hang.

And if the architect be true to himself, what does he mean by Art? Is it what the narrow-minded structural engineer—not the engineer in general, but the narrow-minded structural engineer—for his own immediate, selfish, commercial advancement, says it is—though down deep in his own heart he knows better—a mere ornamenting of the inherent structure with pretty, or supposedly pretty, decorations? I shall not deny—but, rather, shall insist that architects have too frequently given the public, as well as the structural engineer, some show of reason for entertaining at least such a suspicion. Art means, in architecture, not the *application* of anything, but the presence of a guiding and directing spirit through whose intervention the problem should be so solved that function shall be perfect, while through and permeating the material mass the spiritual essence of order, appropriateness, and charm shall warmly irradiate. Charm is a rare word, and its essence is all too rarely distilled into architecture. Catch and hold its fleeting beauty! Art in architecture means that the desires of the soul as well as the needs of the body are fully ministered to. In this age it were perhaps better to say the needs of the soul and the desires of the body. So much, and briefly, for the art. Now for the profession.

The architect who is true to himself will be true in his professional capacity, and so cannot be untrue to the profession. (My inadvertent introduction of "and so" just here reminds me pleasantly of the rather anomalous position I occupy in discoursing in this august presence, even in response to an invitation, upon architectural art and professionalism. The *Journal* of the A. I. A. maintains and has promulgated the idea that my aesthetics, and the ethics involved therein and practised by me throughout a long series of years, are a *blight* on architecture, "from which, however," it opines, "the profession will be secure." In spite of that bar sinister, as it were, across my professional shield, I am inclined to proceed.) What is the attitude, the

state of mind, the state of being almost, which distinguishes professionalism from business? It lies in a dual function of the professional mind: the one phase touching the attitude of the professional toward his client and the other touching his attitude toward his calling, including self and brother practitioner. As toward his client the professional must always hold himself in position to give full and frank advice removed from the slightest possibility of being affected by self-interest. This necessarily prevents the professional architect from engaging in the building trades, or in any building trade; or from letting a direct contract for a client in the architect's name; from operating similarly through a "cost-plus" contract, or even a "fixed fee," as this is liable—extremely likely—to bring architects into competition with each other in point of fees. The architect's disinterested position, that is from the standpoint of self, has been wisely safeguarded in the past. I hope that the Institute as a professional body will never fall from that high estate. Post-war conditions have not made it necessary.

As to the architect's attitude toward his professional self: it should be one of dignity and self-respect, so that he should not feel called upon to slink out of his clothes in the dark when he retires, shunning any waking thought of himself, but so that he should be free and glad to behold his face in the mirror as he brushes his hair in the morning. A man who considers his creative power valueless, who is willing to let any wished-for or hoped-for client illegitimately mother, and through ignorance, impotence, or abortion fail to bring forth well formed the children of his brain, has no self-respect, is not respected by others; has no sense of personal dignity and could not impart dignity or charm even to his legitimate offspring—which are justly looked upon with derision, at least with suspicion, by others. The man who offers his advice for nothing gets just exactly what it is worth—and finds the sum or the equation balanced in the minds of his clients and of the public. If architects, as a rule, were to place a value on their creations and on their advice, giving themselves not in anticipation of favors, but only for the public weal, the vexed problem of competitions would mainly settle itself; a very minor code would be needed. Until that status exists, however, a real code will be required—not a code, by the way, such as has been suggested, which inadvertently opens the field to competitions without sign of supervision, placing restrictions only about a "formal competition" which under such circumstances never would be instituted. Self-respect will beget a respect for others and will be treated with respect by others.

As for business, that term must be made to cover all, and only, the necessary financial and executive or administrative side of the profession, and must not include the participation of the professional man in contractual relations except as with the client. The Institute, through its schedules and codes, should in these business matters be of much fuller assistance to its members—and so, incidentally, to the profession, which depends upon the Institute for leadership and guidance. If the Institute sets the example and is true to itself it will make a real study of the schedule nor hesitate through fear of confusing the public or creating in its mind the impression that the architectural mind is not a unity within itself—a fact which is fairly apparent to that small section of the public which knows or cares anything about the internal working of the profession.



Theseus, Icarus, Prometheus, and Fortuna.

Right side of passage in rotunda leading to State Library.

MURAL PAINTINGS IN THE ROTUNDA, STATE EDUCATION BUILDING, ALBANY, N. Y.

Designed and executed by Will H. Low.



Sculpture, Medicine and Chemistry, Painting.



Architecture, Astronomy and Geography, and Music.

Designed and executed by Will H. Low.

MURAL PAINTINGS IN THE ROTUNDA, STATE EDUCATION BUILDING, ALBANY, N. Y.



Hygeia.



Aspiration.

MURAL PAINTINGS IN THE ROTUNDA, STATE EDUCATION BUILDING, ALBANY, N. Y.



Fountain of Youth.

Designed and executed by Will H. Low.



VERTIAN, THE ETERNAL

Seated amid the ruins of a transitory civilization, Truth uplifts her symbolic mirror, from whose surface is reflected a ray of light illuminating a page of the volume upon which her eyes are fixed, and where may be read these words of Marcus Aurelius: "If thou workest at that which is before thee; following right reason, seriously, calmly, vigorously; keeping thy divine part pure, content with thy present activity, according to nature; with heroic truth in every word thou utterest, thou wilt live happy;—and there is no man able to prevent this." Contrasting with the clarity of the printed page and its definite message the Spinning Woman in the background, and the Medusa head, half-erect, half-prostrate, and the passage of time and the subsistence of error, against which eternal Truth eternally combats.

MURAL PAINTINGS IN THE ROTUNDA STATE EDUCATION BUILDING ALBANY N. Y.



PATRIA, THE INSPIRER

When nomad man drew about him the units of his family and chose a portion of the earth as his abiding place, the love of country was born. Very soon his passion of attachment, his high resolve to defend his hearths and his altars, brought into being the poet to voice his patriotism and inspire his courage. In the stress of Civil War our Republic found such a voice—the voice of a woman—who gave us our battle hymn. Here an attempt is made to portray our young country, standing firmly, uplifting the palm of victory—or death—with eyes awakened to the 'coming of the Lord,' holding a tablet whereon are inscribed verses of the noble hymn of Julia Ward Howe. In the background lies one of the 'hundred circling camps' and in the clouds above appears Homer.

MURAL PAINTINGS IN THE ROTUNDA STATE EDUCATION BUILDING ALBANY N. Y.



ICARUS, THE SKY-SOARER

Filled with a noble discontent of his plodding lot, man, from the birth of day, has tried to break through his natural limitations. Icarus was imprisoned with his father Daedalus, by King Minos of Crete, within walls from which escape was thought impossible. To secure their liberty the ingenious elder fashioned wings from feathers dropped by birds in their passage. Ambitious Icarus, disregarding the advice of his father to steer a middle course, where the humidity of the sea would not weigh down his wings, and to avoid flying too high where the ardor of the sun would melt the wax with which they were fastened, flew within the fatal circle of the sun's radiance and fell. To-day upon his aeroplane our modern Icarus, made wise through centuries of effort, traverses the wide spaces of the sky with almost complete mastery, a reward for his long aspiration.

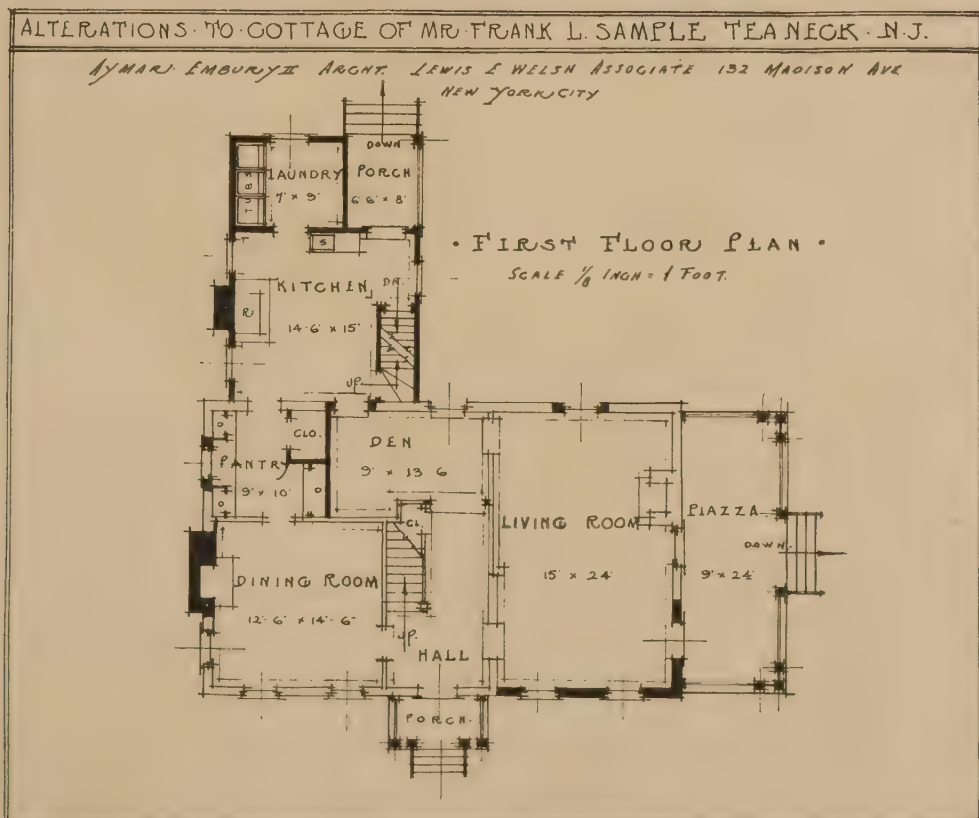
MURAL PAINTINGS IN THE ROTUNDA STATE EDUCATION BUILDING ALBANY N. Y.



ALTERATION OF HOUSE FOR FRANK L. SAMPLE, TEANECK, N. J.

In this period of high prices and scarce labor, every attempt to conserve and reclaim old houses is of interest to architects and home builders. The house was built about eighty years ago, and was straight and square in proportions and design. To suit the conditions of the owner, it was necessary to square out the wing and rebuild a rear frame wing which was in very bad condition.

Aymar Embury, II, Architect; Lewis E. Welsh, Associate.

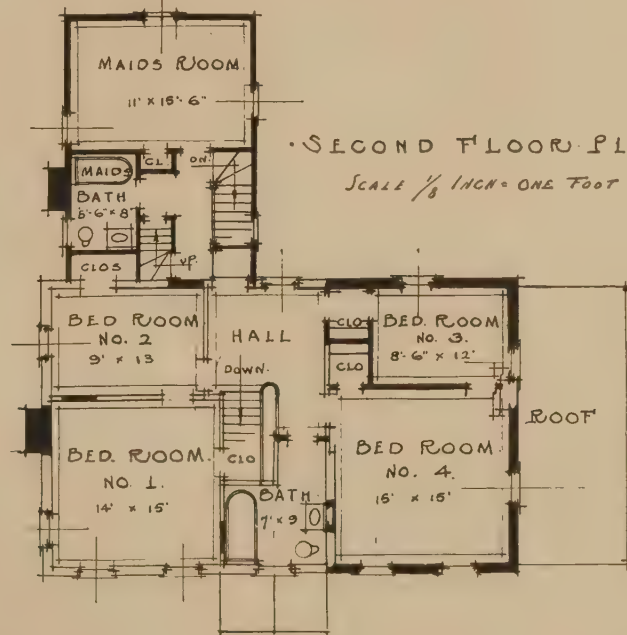


The architects endeavored to do as little altering as necessary to get the house ready for occupancy. The cost of this alteration was approximately \$8,000; a new house of this size and construction, built at the present time, would cost almost double this amount.



ALTERATIONS TO COTTAGE OF MR. F. L. SAMPLE TEANECK, N. J.

NYMAN EMBURY ARCHT. LEWIS. E. WALSH ASSOCIATE 132 MADISON AVE
NEW YORK CITY



The blacked-in portions of the plans show the new work, and it can easily be seen how few changes to the interior of the old house were actually necessary. On the exterior the same cornice lines and details were used in the new work, the windows were left unchanged as far as possible, and the same roof lines extended.

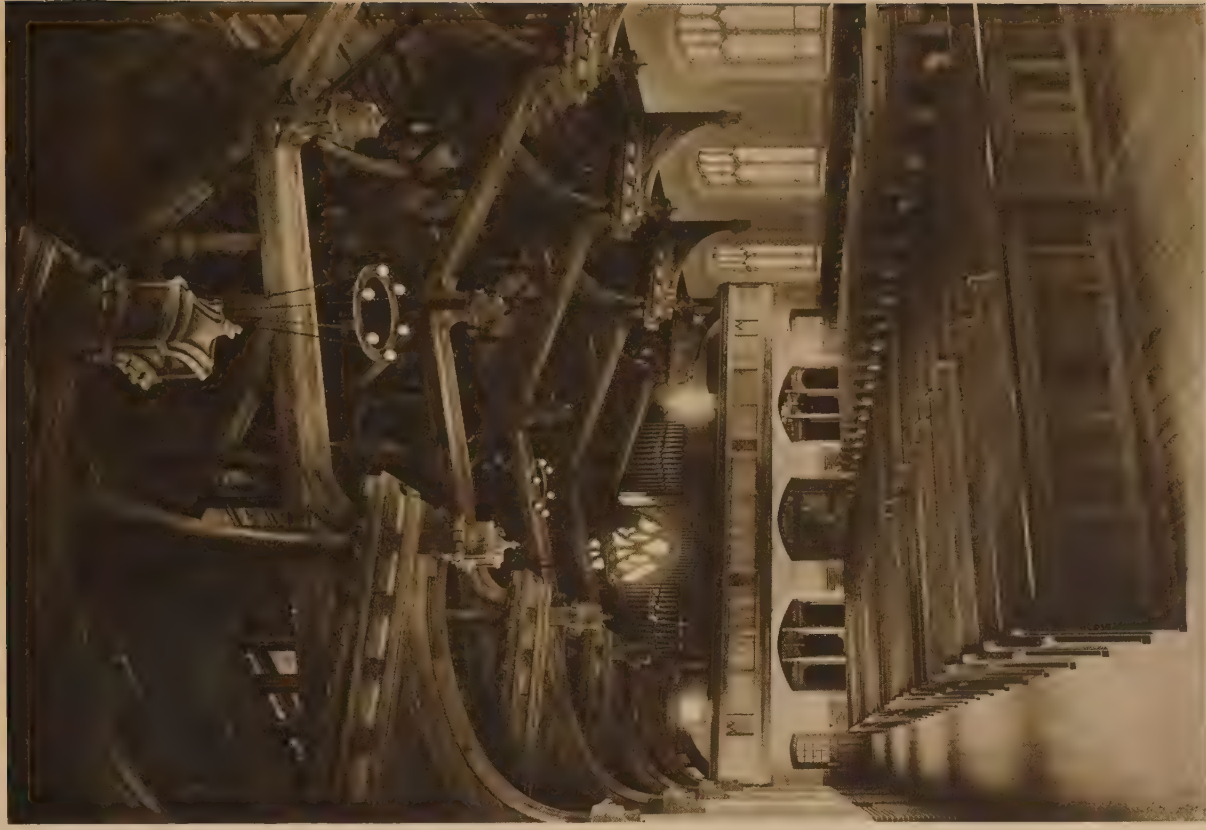


ST. JOSEPH'S ROMAN CATHOLIC CHURCH, FORT EDWARD, N. Y.

M. L. & H. G. Emery, Architects.



ALTAR.



AUDITORIUM, LOOKING TOWARD ENTRANCE.

M. L. & H. G. Emery, Architects.

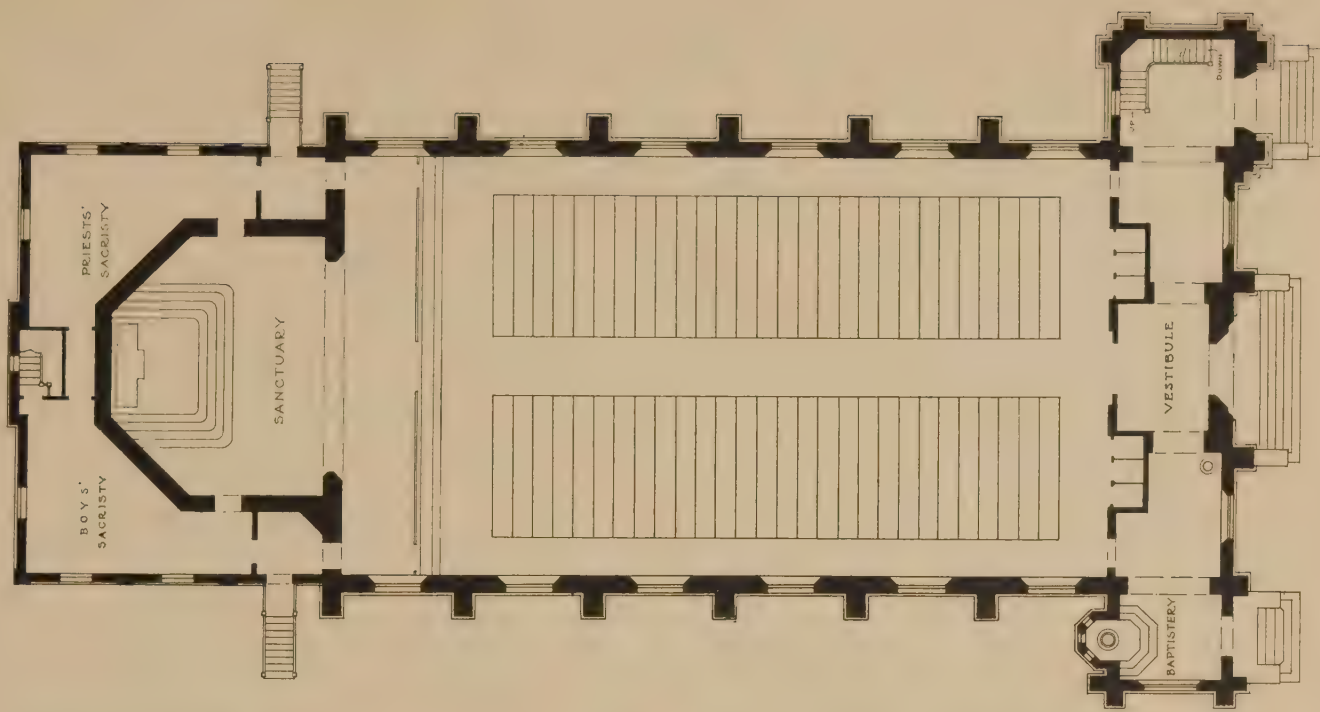
ST. JOSEPH'S ROMAN CATHOLIC CHURCH, FORT EDWARD, N. Y.



REAR.



CHURCH AND RECTORY



PLAN.

ST. JOSEPH'S ROMAN CATHOLIC CHURCH, FORT EDWARD, N. Y.

M. L. & H. G. Emery, Architects.



"Bloomfield," Paget; built c. 1760-1765. South front. Characteristic Bermudian interpretation of Georgian style.
ARCHITECTURE OF BERMUDA.



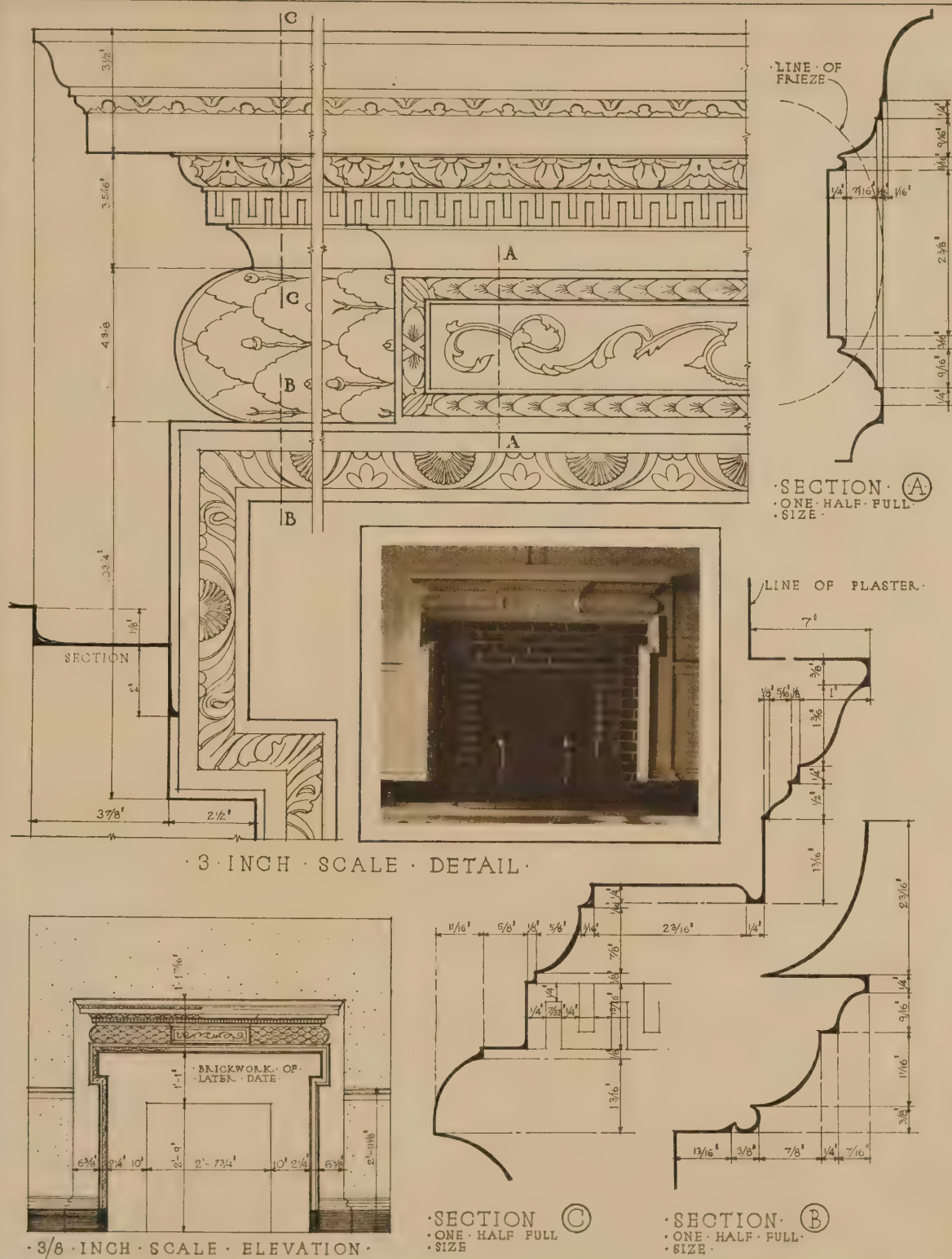
Early eighteenth century house, showing E plan, also ball finials of characteristic Bermuda contour on gate-posts.
ARCHITECTURE OF BERMUDA.



"St. John's Hill House," Pembroke; built c. 1690. Especially interesting as showing not only chimney base with battered weathering, drip-stones, and cruciform plan—this was adopted to secure all the circulation of air available—but also buttresses and ball finial at gable peak.



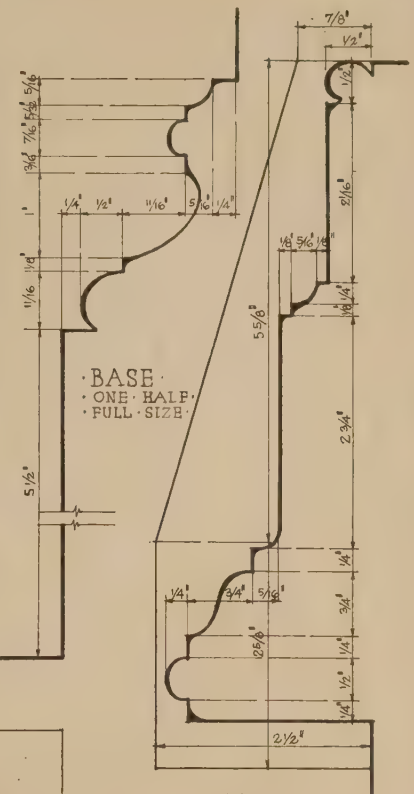
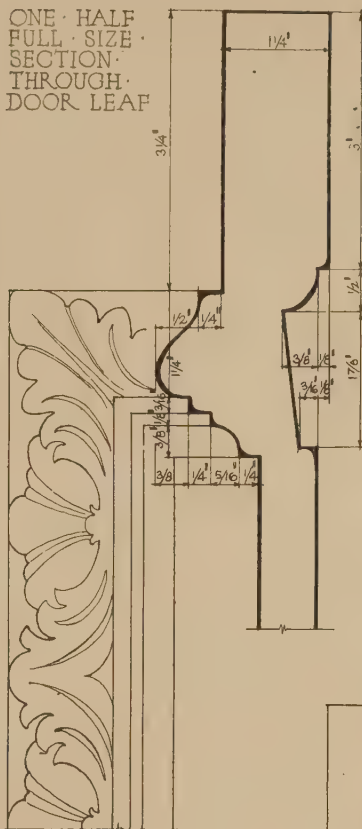
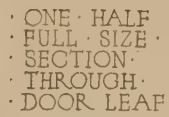
Late seventeenth century house, showing exterior chimney base with battered and stepped weatherings and moulded cap. Also drip-stone and cruciform plan.



·EARLY ARCHITECTURE·
·OF·
MARYLAND

MANTEL
CARVEL HALL
ANNAPOLIS MD.

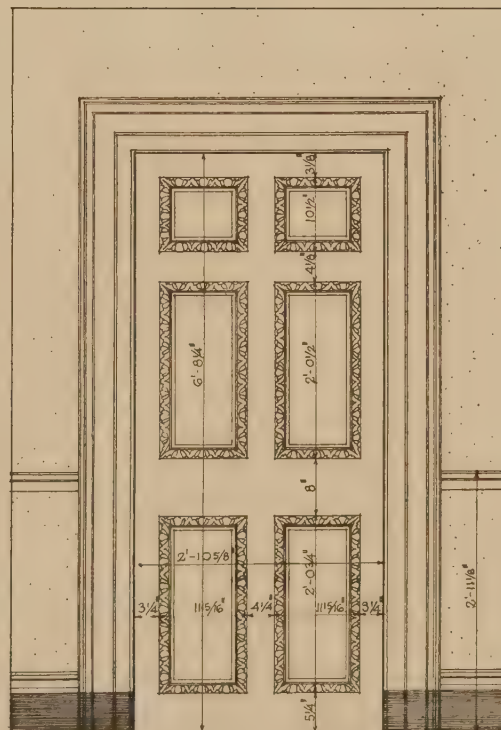
·DRAWN·BY·
·EDGAR·SALOMONSKY·&
·VERNA·COOK·SALOMONSKY·



· BASE ·
· ONE · HALF ·
· FULL · SIZE ·

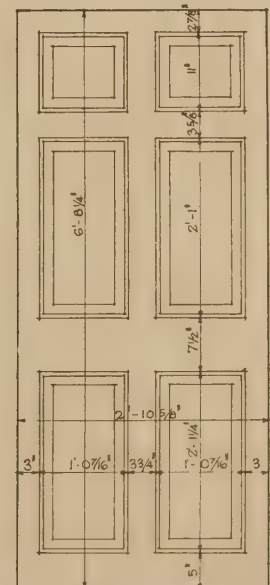


CHAIR · RAIL
3/4 FULL · SIZE



· LIVING · ROOM · SIDE ·

· 1/2 INCH · SCALE · DETAIL ·

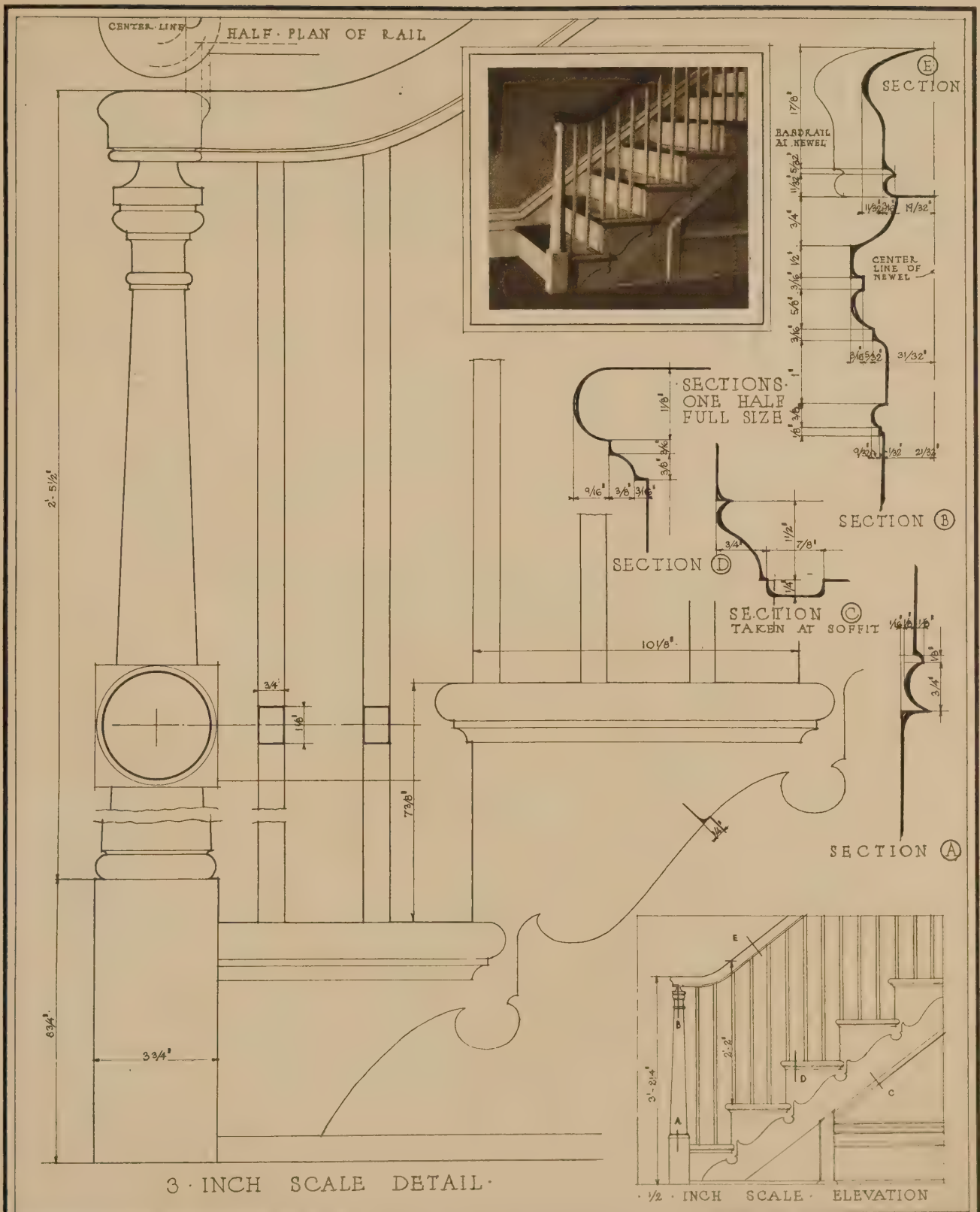


·HALL· SIDE

EARLY ARCHITECTURE
• OF •
• MARYLAND •

· DOORWAY ·
· CARVEL · HALL ·
· ANNAPOLIS · MD.

· DRAWN · BY ·
EDGAR · SALOMONSKY · & ·
VERNA · COOK · SALOMONSKY ·



· EARLY · ARCHITECTURE
· OF ·
· MARYLAND ·

· STAIRWAY ·
· STATE · CAPITOL · BUILDING ·
· ANNAPOLIS · MD ·

DRAWN BY
EDGAR · SALOMONSKY · & ·
VERNA · COOK · SALOMONSKY ·



Literature.

The University.

Mathematics.

Decoration in corridor, second floor.

Mural Paintings by Will H. Low in the State Education Building, Albany, N. Y.

IT is related of Ghirlandajo, the Florentine artist of the fifteenth century, many of whose works adorn Ste. Maria Novella and other churches and museums of Florence, that he nourished the ambition to cover the surface of the walls which enclosed the city in his day with paintings of his invention.

Some similar desire may have actuated Mr. Will H. Low, when, in 1912, he undertook the decoration of the corridor and rotunda of the State Education Building in the city of his birth, for already Albany possessed in St. Paul's Church a large panel of his composition, in one of its notable private residences, that of the late Anthony C. Brady, four lunettes were due to his brush, while since then, in the intervals of work upon the Education Building, Mr. Low has executed a frieze which decorates the Legislative Library of the State Capitol.

In his authoritative work upon "Mural Painting," Mr. Edwin H. Blashfield dwells at some length upon the danger lurking behind the natural impulse of local authorities choosing a son of their city to decorate its public buildings, when the artist thus favored, though possibly gifted with every quality necessary for the task, except that of experience, would find himself facing the unknown quantities of scale, color, mass and line necessary to harmonize with the architectural setting provided for the mural painter.

In our short history of mural painting, instances of such mistakes are familiar to all architects and those con-

versant with the special art of the decorator; but few of our cities would find at hand one of its sons with larger experience in solving these peculiar problems than Mr. Low; who in the work by Mr. Blashfield above quoted, is credited,

chronologically, as immediately following John La Farge and William Morris Hunt, who may be called the fathers of our present school of mural painting.

The work by William Morris Hunt, in the State Capitol at Albany, though it has long disappeared from its walls, marks indeed the very beginning of mural decoration of our civic buildings. As the first decorative work by a competent artist in this country, it seems strange that thirty-five years should elapse before the State of New York should again call for the services of a mural painter, for in the interval throughout our broad land from Maine to California the seed thus sown by Hunt had borne fruit, until to-day there are few public buildings of a monumental character erected

where the mural painter and the decorative sculptor are not called in to enhance the work of the master architect.

The task allotted to Mr. Low was of major importance, not only from the amount of space to be decorated, which, though it amounts to over two thousand square feet, may have been equalled in other cases, but from the subdivision of this space into more than thirty panels, each calling for an independent composition, while almost every panel, though all are of an equal height, is of a different



Our Standard.

width. Again, while each panel calls for individual treatment, they are in most instances so disposed upon the walls as to form groups, where they are seen with so little separation as to demand something approaching a single composition as is evident from the reproductions here shown, from which the result of the endeavor to "tie together" those groups of separate and distinct subjects by means of mass and balance may be judged, though of course the element of color, which has been equally studied to aid this treatment of the subdivided wall, can only be seen in place.

As to the subjects treated, we can best indicate the artist's intention by quoting from an official letter, sent to the Trustees of Public Buildings by Mr. Low, under date of February 20, 1912, at the inception of his task.

"The spaces to be decorated comprise thirty-two panels upon the walls of the entrance-hall and rotunda, separated in all cases by pilasters, and for the most part further divided by detached columns standing about ten inches from and immediately in front of the pilasters. Each panel is twelve feet three inches high, set into the wall about eight feet above the floor, thus lifting them above the level of the eye but well within the line of vision. . . . As to theme or subject I judge necessary to abstain from those representing actual occurrences in the educational history of the State, introducing portraiture or episodic and obvious incidents as out of keeping with the style of architecture embodied in the building and with the higher purposes for which it is designed. . . . Therefore, I shall take for my general theme—so far as a title or description in words may serve: 'The Aspiration of Man for Intellectual Enlightenment and the Results of His Attainment.' Barely stated, this theme may appear obscure or remote, but at this stage of my conception it has the precise advantage of giving the largest latitude to the imagination. . . . The whole design must eventually be orderly and consecutive, the single panels forming parts of a whole rather than relying on their individual interest; though, in this latter respect, as parts of a chain, I shall endeavor to make each link as strong as possible. . . . Throughout the series stress will be laid upon the fact that since the dawn of time certain types of men have possessed insight to fundamental truths, which we in our later day are prone to consider discoveries of our own time. Apparently, primeval man had hardly taught himself to think before he found the older myths crystallized into forms recording activities

similar in essence but anterior in time to his own, and to-day Icarus of the Greek legend is as truly the precursor of the aeroplane as Prometheus, bringing fire from the abode of the gods, serves the industries of the moment. From the standpoint of a mural painter, the most important feature of a scheme of decoration lies not so much in its subject as in its treatment. His first duty is to provide in the space allotted to his work an agreeable pattern, in mass, in color, and in scale, that conforms to its architectural setting; that



Minerva.



shall, in a word, decorate. After that, in the degree that he may be endowed with the quality of imagination, he is justified in using it to the utmost to enter into intellectual communion with his fellow citizens. . . . For the deliberate choice of the subjects I propose to treat, I have a number of reasons. First: for their conformity in subject and style to the purposes of the building and the classic monumental

character of their architectural setting. Second: for the reason that the choice of the artist imposes upon him a continuance of the same class of subjects as those upon which rests his past reputation and his present selection. Third, and last: in undertaking a task of this importance, the

time seems ripe to develop in theme and in manner all that my past experience has taught me rather than to experiment in new fields. . . . Which, being foreign to the temper of my mind, might be less good in execution, while certainly they would lack the lasting appeal with which centuries of thought have endowed the themes drawn from the sources continuously fed by all that we know as education."

Six years have elapsed since the artist outlined this programme, to whose fulfilment he has since devoted his entire time, working in his studio at Bronxville, retired from the interruptions of the city, and withdrawn from all other artistic activities. The complete result can best be judged within the walls of the Education Building, where the sequence of panels supply a continuous pattern of form and color around the spacious walls. The few panels here reproduced show that in the development of his theme Mr. Low has disregarded chronological limitations, and voluntary anachronisms abound in the effort to depict education in the widest sense, from the early gropings of the human intellect to our present understanding.



Large panel representing West Point Military Academy. In the foreground is shown a reproduction of three links of the heavily forged chain which in the days of the Revolution was stretched across the Hudson at West Point to bar the progress of enemy vessels.



"Build Now"

By Harold E. Paddon, Architect

DURING our country's participation in the world's conflict, the government put a ban on building with a view to stimulating every energy in the one big purpose, *i. e.*, "to win the war," and it was considered unpatriotic to invest any money in construction work during that period.

Practically all the wheels of necessary progress on building were at a standstill, with the result that at present there is an acute shortage of dwellings to house the ever-increasing population, with the result that rental values have increased materially, thus making it almost impossible to secure a livable house at a moderate expenditure. Federal authorities, seeing these conditions, have published bulletins stating that it is now a patriotic duty to build.

Before comparing the relative costs of to-day on suburban work with those of 1914, the following quotation may be a fitting suggestion, serving as a plea for careful construction:

"In the elder days of art,
Builders wrought with greatest care,
Each minute and unseen part,
For the gods see everywhere."

The houses illustrated in this Number (see pages 197, 200, 201, 206, 207, 208) were built prior to and during the war, and with view to a broad comparison of prices it would appear that at the signing of the armistice the increase generally in the trades approximated 27½ per cent during the period of 1914-1918.

Although some of the unskilled labor increased many times the former wage, it is not logical to include the increase as staple, as it was only for a short duration and only to augment the law of supply and demand covering government needs.

Since the latter part of 1914 the costs of many of the materials required in suburban construction have been increased, and in most instances the present-day price is be-

tween 25 per cent and 30 per cent higher than the prevailing prices of 1914.

The disruption in labor conditions is playing a large part in the present wage prices in the various trades, which are continually fluctuating, thus causing a wide range in building costs in different suburban localities.

The writer recently compiled a construction chart covering a number of suburbs within a range of twenty-five miles of New York City, with a result that an increase was indicated on material and labor ranging from 28 per cent to 34 per cent over pre-war prices.

The rental values in the cities are increasing continually as the housing condition becomes constantly more acute. Land in suburban localities can be procured to-day at a reasonable figure. Banks and loan companies are now in a position to make attractive loans on substantial properties.

These facts offer an opportunity that should not be overlooked by progressive suburban developers or the individual who contemplates the construction of a home.

In giving consideration to the prospects of cost reduction, it is fair to assume that they will not be reduced sufficiently for a long time to warrant a delay in contemplated construction work, and as the country is on the threshold of an unprecedented building activity, the most logical way to reduce costs is to successfully combat the existing conditions by building extensively, this will play an important part in re-establishing prices.

Careful consideration must be given to all details, including plumbing and heating installation. "Fit to live in" should be the watchwords. In fact, nothing will be gained by building at a wholesale rate simply to cover the land in order to meet the present demand.

The initial cost should be the main cost. Upkeep must be minimized. Good houses are in demand and always will be.

To build now is a duty. To make structures "fit to live in" is the duty of architects and builders.

Announcement of Awards in the Fourth Annual White Pine Architectural Competition

The Fourth Annual Architectural Competition conducted by *The White Pine Series of Architectural Monographs* was judged at The Biltmore, New York, on May 23 and 24, by the following architects: Walter H. Kilham, Boston; H. Van Buren Magonigle, New York; Dwight H. Perkins, Chicago; Ernest John Russell, Saint Louis, and Waddy B. Wood, Washington, who composed the jury of award.

The First Prize was awarded to Maurice Feather and Niels Larson, Boston, Mass.

The Second Prize was awarded to William J. Mooney, Jamaica Plain, Mass.

The Third Prize was awarded to Leslie W. Devereux, New York, N. Y.

The Fourth Prize was awarded to Frederick C. Disque, Maurice E. Kressley, and Albert A. Farnham, State College, Pa.

MENTIONS

Paul R. Williams, Los Angeles, Cal.; Carl C. Tallman, Auburn, N. Y.; J. E. Maier, T. E. King, and F. Lang,

Toledo, Ohio; Charles R. Mink and O. R. Eggers, New York, N. Y.; Henry Herbert Dean, New York, N. Y.; Clarence E. Wechselberger, Chicago, Ill.

All of us are indebted to Mr. Whitehead for his admirable series of White Pine Monographs. They are invariably a charming as well as valuable addition to our architectural records. No. 3 of Vol. V, recently published, contains a number of interesting "Historic Houses of Litchfield," with an introduction by C. Matlack Price.

Announcements

Major George Oakley Totten, Jr., architect, announces the reopening of his offices at 808 Seventeenth Street, Washington, D. C., closed during his military service with the Engineers, U. S. A.

Mr. William S. Post and Mr. J. Otis Post announce that Mr. W. Sydney Wagner and Mr. Robert R. Houston have been admitted to partnership with them, and that the business is to be continued under the present firm name of Geo. B. Post and Sons, Architects, at 101 Park Avenue, New York, and Schofield Building, Cleveland.

A SIX ROOM HOUSE
HAROLD E. PADDON, ARCHITECT
NO. 280, MADISON AVE., NEW YORK CITY

FIRST FLOOR.

SECOND FLOOR.

A SEVEN ROOM HOUSE
HAROLD E. PADDON, ARCHITECT
NO. 280 MADISON AVE., NEW YORK CITY

FIRST FLOOR.

SECOND FLOOR.

Getting What Is Specified

By David B. Emerson

IN my previous articles I told some of the many things necessary in the writing of specifications; in this one I will discuss the most important part of the work—that is, getting what you have specified.

As, to quote one of the old axioms of the Architectural League of America, “after all, the building is the thing!” so no matter how good the design may be, how well the drawings are made, or how carefully the specifications are written, it all counts for very little if the contractor does not follow them. After the draughtsmen and the specification writer have finished their work, then the ultimate question of whether the owner gets what is called for or not, lies with the superintendent. And more than one architect has had his troubles due to lax methods of superintending.

Now these, like most commonplaces, are overlooked, especially by beginners, for whom these articles are largely written. Wherever the specification calls for materials of special makes or brands, the superintendent's work is comparatively easy, as he merely has to see that they are delivered at the building in the original packages, being careful, of course, to see that one bag, can, or barrel is not used where a dozen or more are needed for the work, and to watch carefully for adulteration or substitution on the work. But where materials are specified to have certain qualities and to come up to certain standards, he must be able to inspect the materials and where necessary make certain simple tests to ascertain if they are as specified. Right here I will suggest that the superintendent in addition to the indispensable rule provide himself with a fairly strong pocket magnifying-glass, which will come in very handy many times in making close examinations of doubtful materials, where the naked eye will not be able to detect what the glass may show; a pair of calipers large enough for three-inch circles, which will often come in very handy for measuring pipe, bars, etc., already in place, also for determining the thickness of sheet metal, etc. As in my earlier articles on specification writing, I will take up the various parts of the work in the sequence in which the specification should ordinarily be written.

The first materials to be delivered at the job are almost invariably the concrete aggregates, the sand for mortars, the cement, and the reinforcing steel. Sand either for concrete or for mortars should always be specified to consist of clean, sharp, coarse grains, uniformly graded in size, the largest grain not to exceed one-quarter inch in diameter and not to contain more than five per cent of clay or loam and to be free from all other impurities.

Sand may be tested at the job, in several ways: first, by rubbing the damp sand in the palm of the hand to see how much loam can be scraped off, by crunching the sand in the hand near the ear, to tell whether it is sharp or not; the use of the magnifying-glass will give a very good idea of the shape and grading of the grains; a second test for loam is to put a handful of sand on a clean sheet of white paper, place it in the sun or near a heater to dry, roll the paper back and forth, and notice the amount of fine loam on the edge; the third, and perhaps the most accurate, method of testing sand is to put a sample of the sand in a cylindrical, clear glass bottle, fill the bottle nearly to the top with water and shake thoroughly and allow it to settle. The sand will

settle to the bottom and the dirt will be on top. Measuring the column of sand and dirt with a rule will give the percentage of dirt with a reasonable degree of accuracy.

Broken stone should be inspected to see if it complies with the specifications as to size, and also that it does not contain crusher dust, in which case it must be screened to remove the dust. If gravel is allowed to be used as an aggregate in concrete, it should be carefully inspected to see if it contains a large percentage of sand, also if the stones are coated with clay or other injurious matter. If the gravel is found to contain too much sand, it should be screened; the amount of sand may be determined with a reasonable degree of accuracy by sifting samples with a hand-sieve. If the stones are coated with clay and the gravel is dirty, it should be washed.

If high carbon steel has been specified for reinforcing material, the superintendent should examine all bent bars very carefully for cracks or fractures, as high carbon steel, being very brittle, is liable to fracture in bending.

Cement can only be properly tested in a laboratory, so all that can be done on the job is to check over the mill tests, see that cement is finely ground and contains no lumps, that none of it has been exposed to dampness, and that no packages are broken. Also, see that all cement is properly stored in a water-tight shed, and well raised above the ground. Lime for mortars or for plastering should be specified to be freshly burned lump lime. Lime may be tested by slaking, and watching how it falls to powder, a good lime falling to powder without any hard core remaining. Freshly burned lime is in hard lumps, and not powdered.

Brick should be hard-burned, of even color, square, and well shaped, free from swollen, checked, or refuse brick. The superintendent can easily judge color, shape, and general condition of the brick by looking them over carefully; soft brick generally have a reddish-yellow color. To test brick for hardness, strike two together and note the sound: good, hard-burned brick ring when struck, while soft brick give a dull sound. When broken, a good-quality brick should show a compact, uniform structure. Brick should absorb some water, as an absolutely impervious brick will not lay up successfully in mortar. To test its absorptive quality set a brick in water for twenty-four hours; at the end of that time it should have absorbed not less than six per cent and not over twelve per cent of its weight in water.

Structural cast iron should be very carefully inspected for blow-holes, cold shuts, or honeycomb. The best method is to tap carefully with a hammer, especially at all points of bearing, and note the sound. Where holes have been filled with foundry sand or loam a dull sound will result, and the castings should be rejected. The inspection of lumber and timber is one of the most difficult tasks which come to the superintendent, as in practically all grades a certain number of defects are allowed by the grading rules of the lumber associations, so he must familiarize himself with those rules before inspecting lumber and timber.

Loose or rotten knots, or injurious shakes, are very easily detected. To test timber for decay, strike with a hammer; good, sound timber rings when struck, while a dull heavy sound indicates decay. Also, when a sound timber is struck lightly at one end, it can be heard distinctly at the other end

of a long stick, if the ear is placed close to the timber; but if it is decayed, the sound will be very faint. To make this last test, of course it will be necessary for the superintendent to have an assistant, so it is not very practical.

There is probably no one trade employed on a building about which there is more uncertainty on the part of the superintendent than that of the painter. In fact, the architect is practically at his mercy, except as he may use labelled materials taken directly from the original package.

Lead, oils, and varnishes are all subject to adulteration, and in many cases it can only be proven by careful laboratory tests, but a number of the more common adulterants can be easily detected by simple tests on the job.

Pure white lead, if heated on a slip of glass, will turn yellow. One of the commonest adulterants of white lead is sulphate of baryta; this may often be detected by simply rubbing a small quantity of the lead between the thumb and finger, and noting the gritty feeling it produces. A very simple method of testing the purity of white lead is as follows: Place a small quantity of the white lead to be tested on a lump of charcoal. Blow the flame from a blowpipe, either from a gas-jet or from a small spirit-lamp, on to the white lead. The lead will be quickly reduced to metallic lead, and the baryta or the silex will separate from the lead.

Red lead is very often adulterated with brick-dust, and sometimes with red oxide of iron; these may be detected by the same test as is used for white lead, only red lead will need a greater amount of heat than white lead, as oxide of iron has been burned in its preparation. This test will leave a mixture of yellow lead oxides and the red adulterants.

The commonest method of adulterating linseed-oil is the addition of fish-oil. This may be detected by putting equal parts of oil and strong nitric acid in a glass vial, shaking well, and allowing it to stand for from ten to thirty minutes. At that time the mixture will be found to have divided into two strata. If the oil is pure, the upper stratum will be a muddy olive-green, which will gradually change to brown, and the lower stratum will be almost colorless. If fish-oil has been mixed with the linseed-oil, the upper stratum will be a decided deep red-brown, and the lower stratum will be a deep red or cherry color. When varnishes are not specified by name or make, they should be specified to contain no rosin

or petroleum products, and to contain at least seventeen per cent of copal gums. A very easy method of determining whether a varnish contains rosin is to put equal parts varnish and strong ammonia in a vial and shake well together. If the varnish contains a large quantity of rosin, it will set in a solid lump; if it contains a smaller quantity, a few solid lumps will result.

The inspection of window-glass is another item which also requires very careful judgment on the part of the superintendent. As all sheet glass, on account of the method of manufacture, is wavy, no glass can be rejected on account of waves. Sheet glass is specified to be either A, B, or C quality, double strength or single strength. A grade should be free from cords of any kind, stones, blisters, except an occasional small blib caused by melting or very fine dust blisters, and it must not be wavy enough to distort vision. B grade may have some of the above defects to a minor degree, but must be free from stone, surface cords, furnace scratches, pipe blisters, or small broken fragments attached to the surface of the glass. C grade admits of any and all defects except stones.

Although sheets thinner than one-eighth of an inch are acceptable as double strength, eight sheets of double strength should pile an inch high or thereabouts, a little leeway always having to be allowed.

Plate glass should be examined very carefully for bubbles and gray spots, and if an excessive number are found, the glass may be rejected.

In the inspection of building materials, there is one thing about which the young superintendent must be very careful, and that is never to condemn any materials until he is positive that they are not according to the specifications, or of the quality called for, as there is nothing which has a greater tendency to destroy the superintendent's prestige with the contractors than to be obliged to frequently reverse his decisions.

But when he is positive that his decision is right, then he should stand his ground and order any materials which do not come up to the standard removed from the premises, and no arguments, threats, or entreaties should move him, except where the owner is willing that the material should be used, and the contractor will make a proper allowance to the owner for using such materials.

Building Deficiency in the North Central States

AS a result of the war there is a building deficiency in the North Central States in the sum of \$1,511,200,000, according to an estimate just made public by the Information and Education Service of the United States Department of Labor. A recent survey of building conditions in the North Atlantic States, made by the same department, placed the deficiency in that district at \$1,200,000,000. The North Central States survey shows deficiencies in the States as indicated below:

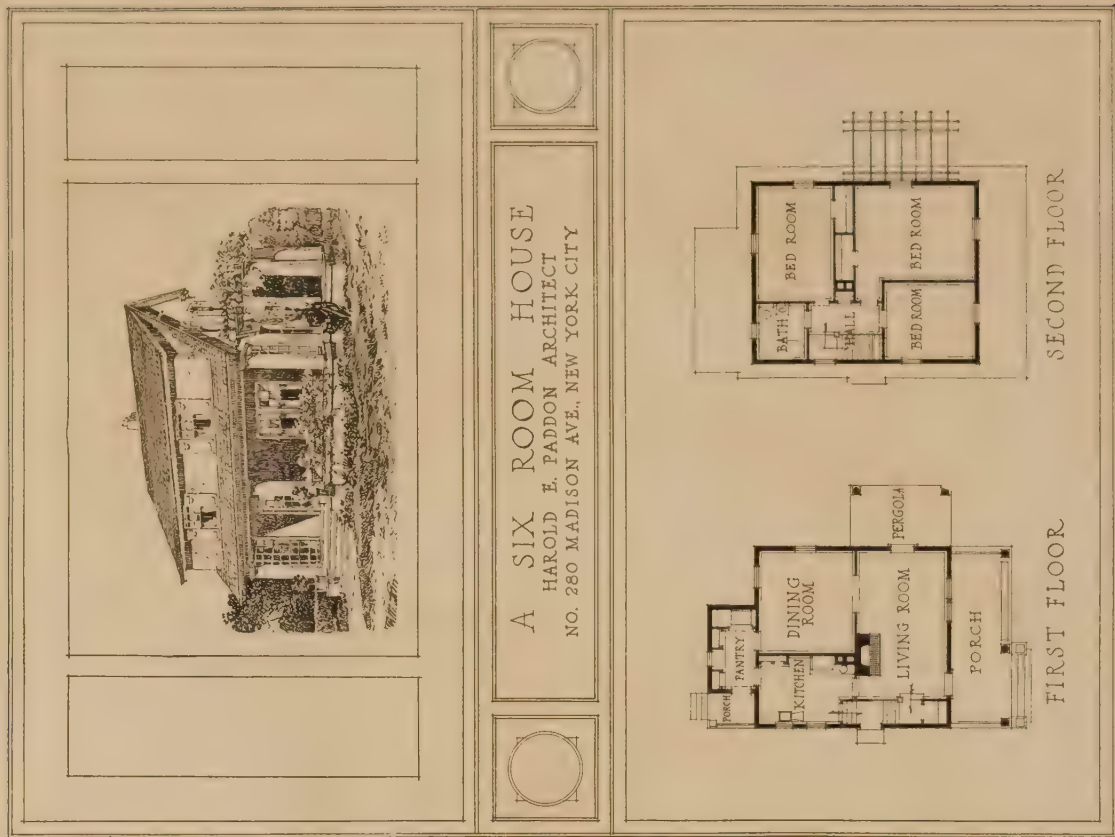
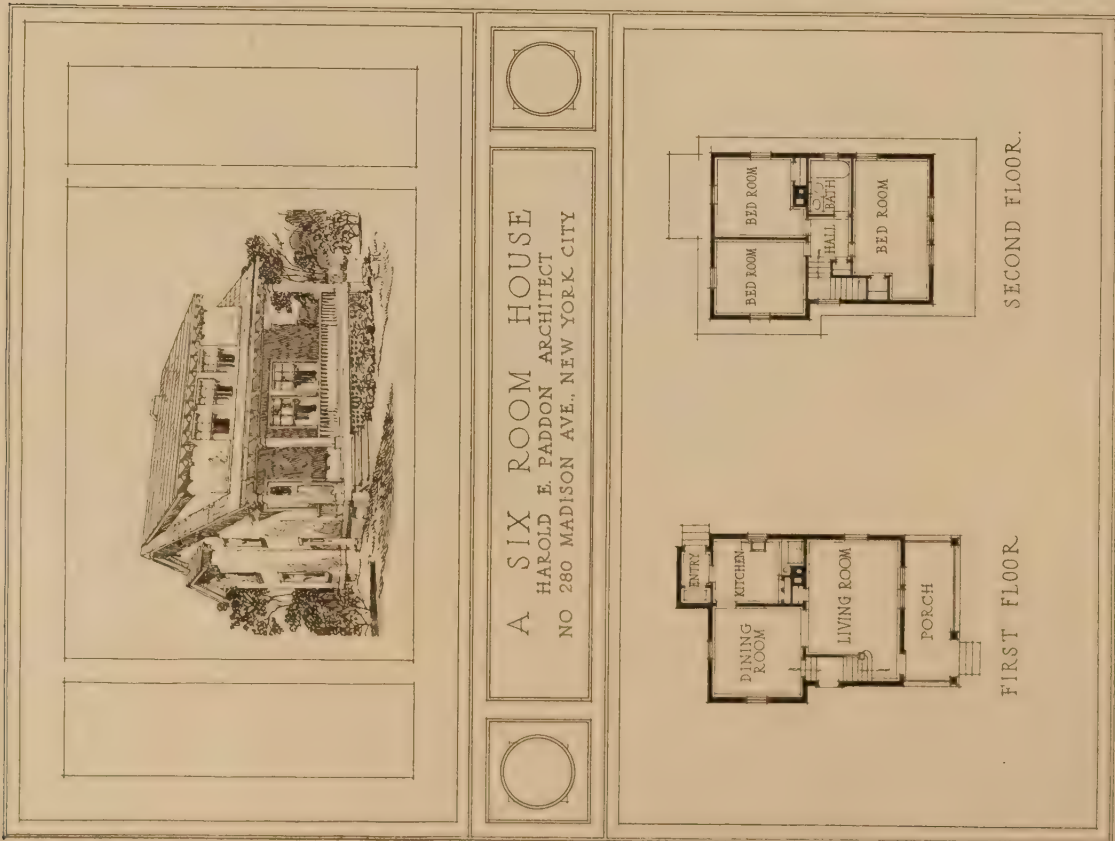
Ohio.....	\$235,000,000
Indiana.....	44,500,000
Illinois.....	317,000,000
Michigan.....	130,000,000
Wisconsin.....	131,000,000
Minnesota.....	273,000,000
Iowa.....	18,000,000
Missouri.....	55,000,000
Nebraska.....	52,700,000
North Dakota.....	42,000,000
South Dakota.....	153,000,000
Kansas.....	60,000,000
Total.....	\$1,511,200,000

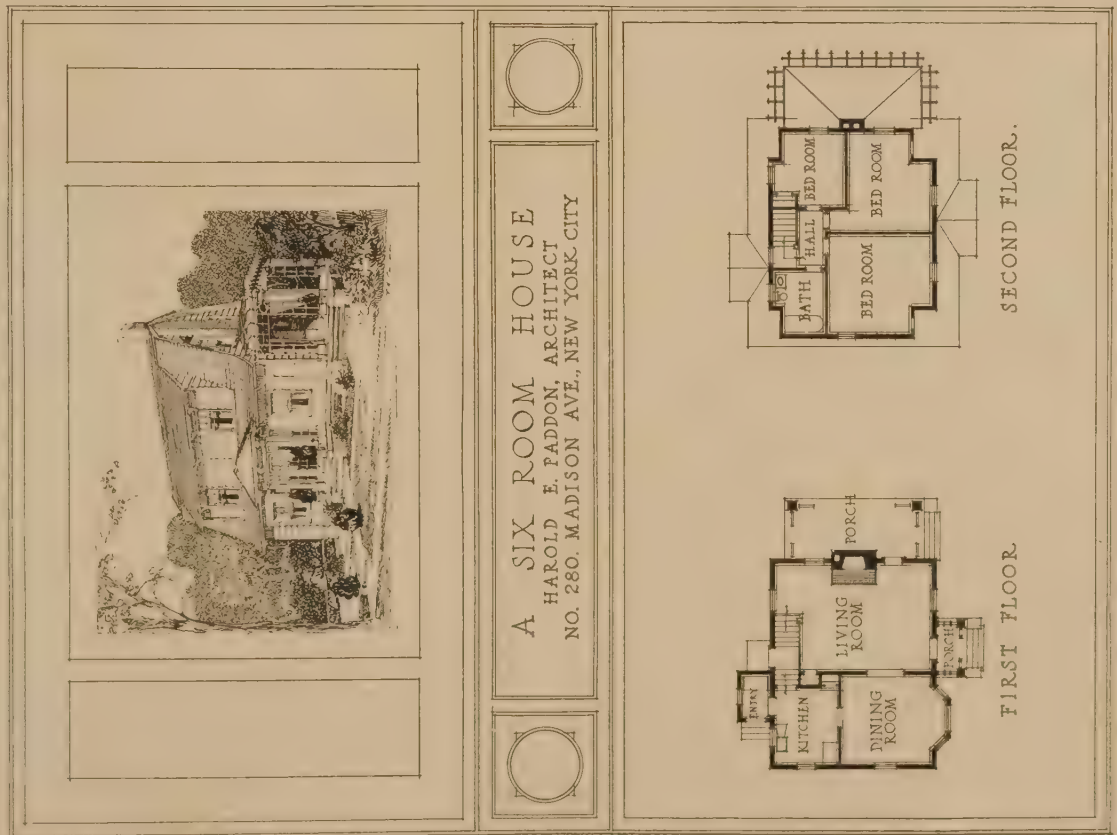
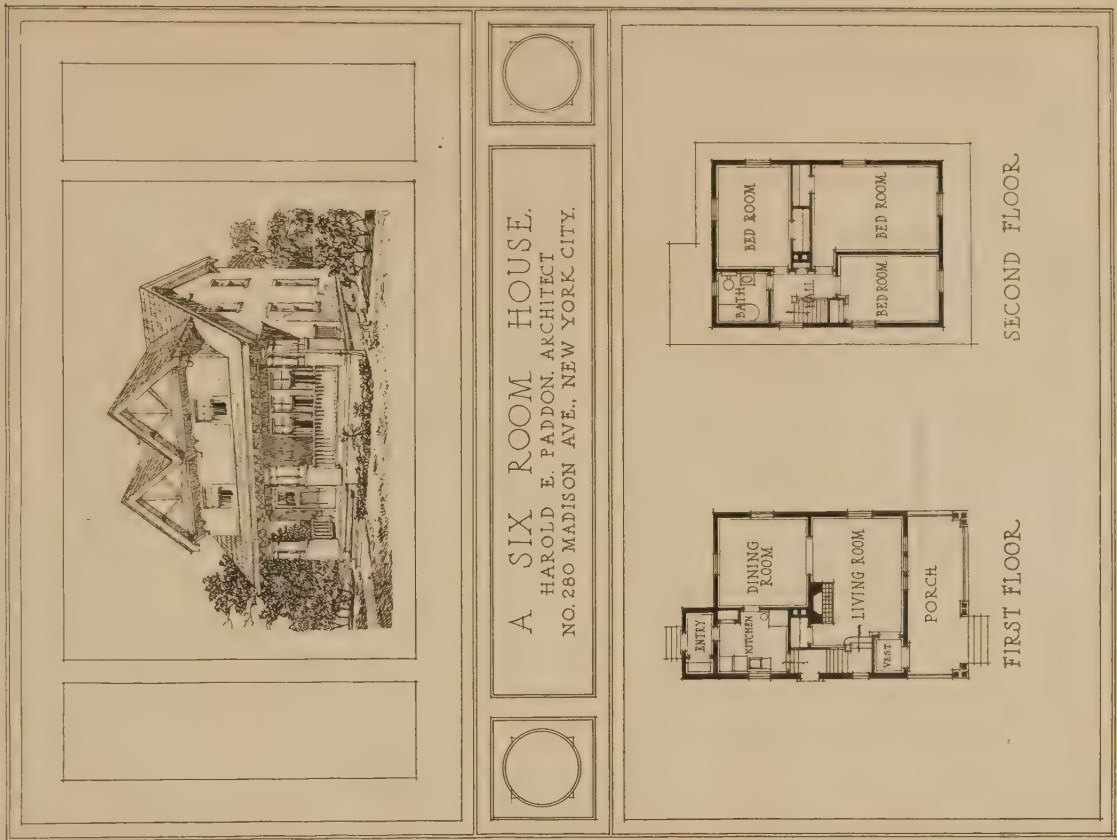
In each of these States building interests and real-estate boards report a shortage of residential property. Ohio and

Illinois need, also, apartment houses. There is a marked shortage in school buildings in all the States, and most of the cities mentioned report a shortage of store and business quarters. A deficiency in workmen's dwellings is reported from Chicago, Detroit, Cleveland, Indianapolis, Cincinnati, and Milwaukee.

This deficiency must be made up in addition to meeting the normal current needs in 1919. In view of this fact the Department of Labor's statement that the current year is likely to prove one of unprecedented building activity seems to be fully justified. The latest reports on building permits and contracts let indicate that building construction work the country over rapidly is getting back to pre-war figures. The new normal, however, will be far ahead of pre-war figures.

The rapidity with which building and construction work is reviving indicates very clearly that building interests are convinced there is to be no material reduction in construction costs for several years, if at all. This conclusion is inescapable in view of the studies of market and labor conditions recently made by economists in the Information and Education Service of the United States Department of Labor.





Rhythm in Our Architecture*

By David Varon

FOR many years it has been the custom when any one was desirous to build himself a house, either in the city or in the country, to hunt up in his memory the most pleasing image of some Middle Ages or early Renaissance structure seen abroad, then turn to the best architect among his friends for the carrying out of his conception—or would-be conception. The result of such a procedure is to be seen especially in the productions of the last three or four decades, to the extent that in some of our cities there are whole districts looking more like the “Rue des Nations” in the Paris World Exposition of 1900 than anything else. All the styles under the sun can be seen. The Moorish rubs elbows with the mission style, and both greet smilingly the Romanesque, the great range of French and English Gothic and the score of early Renaissance, not counting all the Louis.

To-day we know better. Our people have more than vague desires. The millions lavished on education have not been entirely spent in vain. Not only have our schools of architecture been doing splendid work, but—and this is what is remarkable—a more general craving for music has begun to tell on all the products of art.

All these factors exert their great influence on prospective proprietors. And though we might apprehend some new wave of plagiarism similar to that of the eighties, the artistic education of the thousands returning from Europe will be comparatively an easy task. Though they may have been as strongly impressed by the same old châteaux and manors as were their fathers some forty years ago, they will appreciate the importance of an harmonious atmosphere and realize that one cannot transplant masterpieces wonderfully set off by appropriate scenery into a place offering not infrequently a forest of smoking chimneys as a background, a practice which does justice neither to America nor to Europe.

We knew before, and this world war has only put more emphasis on the fact, that our ways of thinking differ from those of Europeans. We are quicker in many respects and likewise our views of life are not the same. But we have many points in common with the Old World of which we are the offshoot. But in spite of this close relation, and possibly owing to it, we are inclined to live our own lives and to give them an adequate expression.

Those who are eager to know—and they are legion—by what means we can use the same architectural elements that are used on the other side and yet impart to our creations a distinctive American note, will be curiously interested in the statement, no doubt, that it is possible to further such an achievement through the application of musical principles. In the past many have gone to historic styles not only for inspiration but for patterns, and they were in many instances disappointed, while others who acted with a much freer mind, hunting only the principles of real style, found it, and achieved interesting works.

What was the latter's secret? They have understood that neither the amount of money lavished on a structure nor the heaping up of sculptures and ornaments borrowed from whatever period of architecture could impart any real merit, a real style, to their work, but the harmonious ordination of the various elements of a programme with a view to “SERVICE, TRUTH, and ÆSTHETICS.” These principles well

applied by persons of talent will produce original works, and nothing else will do it.

We see rhythm in nature at every step. The wind blows more or less strongly and there are either the flying clouds or the bending branches to and fro that register its fleetness. Then the waves of the river or the ocean billows make each in a way the idea of rhythm. Here is a ripple begotten by a gentle zephyr so lovely in comparison with the mountains of water lifted up by the raging storm. Between these two extremes we can conceive a large number of various rhythms marking joy or sadness, repose or strain, etc. . . . Can these sensations find place in architecture?

Whether we look on nature or on man, the law of rhythm rules everywhere. It is interesting to find a certain analogy between the craggy peaks and certain types of warriors in action; on the other hand, the gentle silhouette of a hilly country will find a counterpart in the gracefully reclining girl. Now, edifices, as a natural corollary, bear the same relation to the human being in regard to “rhythm” as does mother Nature. The inference to be derived from the foregoing is that the prevailing attitude of mind of a person will be strongly impressed on his own house if the architect has taken it seriously into consideration. After all, various expressions imply various attitudes, various rhythms. Gentle repose accompanied with a calm, quiet activity are expressed by the gently reclining and reading person. Should we follow his general outline we will soon find out that a similar one, at least in its rhythm, will be found in the silhouette of a lovely yet unsymmetrical mansion. Here life is not strenuous, neither is it altogether devoid of all activity, but what there is to be found is gentle, that makes life lovable. On the contrary, the stern and frigid person will have his home look like a barracks. The attitudes will be the same. In that severely symmetrical residence with hardly any rhythm at all lives a person very particular about things and whose companionship may be rather a strain. As a contrast we see a little further the charming welcome of the hostess written on the very premises. As the martial gait differs from the dancer's step so do the elements of architecture in their various arrangements. The reason why an architect ought to draw so much from life is precisely that expression does not depend for its action on shape and color of garments but on attitudes on the contraction or the relaxation of the muscles of the face or body.

Looking upon the coming residential architecture in this light we can see at once a new world dawning. If, according to certain authors, to each throbbing of the heart corresponds a special rhythm, the beating of American hearts being somewhat different from people abroad, owing to the more strenuous life of our citizens, it follows, as day follows night, that our architectural productions, though using elements expressed by the same vocabulary as the other side, will, on account of our different aspirations and the difference of angle from which we look upon life, be bound to have that subtle touch characteristic of its national soul which shall be called American. With the help of a more wide-spreading art education we shall, perhaps, be able to read in the very general lines or silhouette of our home the American's trend of mind. And let us hope that the popular art reading will help in bringing about the end of the riotous football-rhythmed house, for a long time too numerous in many of our cities and suburban towns.

* The author recently gave a lecture on the subject before the Institute of Arts and Sciences of Columbia University.

The Domestic Architecture of Bermuda

By Harold Donaldson Eberlein



"Bloomfield," Paget; north front and garden enclosure.

BERMUDA'S houses have hitherto had but scant attention from students of architecture. Just why, it would be hard to say, unless Bermudian architecture be one of the things habitually overlooked because of its proximity, or else because of the prevalent misconception that it is merely a degenerate Spanish derivative without any special significance.

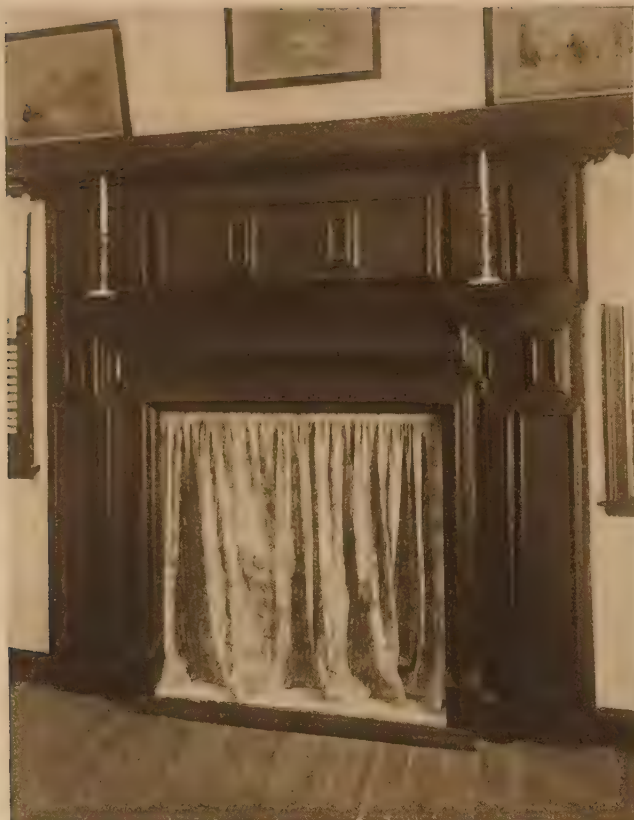
As a matter of fact, Bermudian architecture possesses a very strongly marked individuality; it is thoroughly English in its provenance, without any alloy of decadent Hispanic influence; and, considering the present situation in American domestic architecture, it carries a body of suggestion from which we may well profit.

Between the architecture of Colonial America and the architecture of Bermuda, there exist certain clearly traceable analogies, although in the ultimate outcome each differed widely from the other. Both were developed almost wholly without architects. Both were the products of pure English tradition modified by the local exigencies of climate and available building materials. In both cases the types were determined by architectural conceptions that had become a definitely essential part of race consciousness. Both showed the result of the artisan working in the light of his inherited methods of craftsmanship and in clear recollection of forms familiar to him in England but, with practical common sense, adapting the fashion of his handiwork to the necessities laid upon him by new conditions. Both, from time to time, experienced and reflected the fresh impetus of style influences from England, which were assimilated according to the needs of the situation. In both were the transplanted root and stock English; in new soil

and under new environment, both bourgeoned and fruited in a new and highly individual manner. The parallelisms proceeding from a common origin and the modes of subsequent variation afford an opportunity for instructive comparison.

There are but two native building materials in Bermuda—the rock coral, of which the island is chiefly formed, and cedar. The rock coral, when freshly sawn from the quarries and cut into blocks of the desired dimensions, is of a warm cream color that weathers to a silver-gray. When first cut it is so soft that one might almost call it plastic; it can be dressed with a hatchet or even carved with a knife. It hardens somewhat upon exposure to the weather but is so porous that, for its preservation and the exclusion of damp, walls are usually given a thin jacket of stucco or washed with several coats of a cement wash. The same rock coral, which is very light, is cut into tiles about an inch thick and used for the roofs. These stone tiles, or "slates" as the Bermudians call them, laid on stringers resting upon cedar rafters, perpetuate the Cotswold tradition of stone tile roofing. The roofs are cement-washed to make them weather-worthy and then whitewashed annually by legal prescription, to insure purity of the water-supply, which is dependent upon rain-water conveyed into cisterns.

The cedar is really a species of juniper, but so like red cedar in appearance and quality that it has always been called cedar. It would be foolish, therefore, to attempt to change the nomenclature. In the older houses it was used for everything from floors to rafters. Now, since trees of large growth have become comparatively scarce, other lumber and millwork are commonly imported from the



"NORWOOD," PEMBROKE. MANTEL DETAIL IN BED-CHAMBER.



"NORWOOD," PEMBROKE; BUILT C. 1680. SEVENTEENTH CENTURY STAIRCASE DETAIL.



STAIRCASE DETAIL FROM LATE SEVENTEENTH CENTURY HOUSE IN ST. GEORGE'S, NOW OCCUPIED AS A NEGRO TENEMENT.



"CLERMONT," PAGET; BUILT C. 1760.



"Waterlot," Southampton; parlor, showing "tray" ceiling. Parge ornaments added c. 1770.



"Waterlot," Southampton; built 1710. Showing shaped gable.

States. The old cedar woodwork is exceptionally beautiful and in its appearance curiously combines some of the qualities of both old oak and old mahogany.

The earliest phase of an English traditional style in Bermudian architecture dates from the seventeenth century, and is reminiscent of late Gothic influence as manifested in the familiar Cotswold type. Over many of the windows occur arched and corbelled dripstones—"eyebrows" the Bermudians call them—fashioned in a modified form convenient of interpretation in the local material. In not a few cases the present upright windows with double-hung sashes have replaced ranges of leaded casements, a change noted in some records as early as 1711. Slender chimney-stacks with necking and carefully moulded caps also indicate Tudor survivals from Gothic antecedents; the same influence is seen in the exterior chimney bases with battered weatherings, in the occasional occurrence of buttresses, and in the retention of finials at gable peaks, the gable ends being finished flush with the walls without moulded coping, eaves, or barge boards. The interior woodwork detail of these early houses shows unmistakable derivation from seventeenth-century English prototypes.

A later phase of Bermudian development reflects modes dominant in England in the late seventeenth century and during the reign of Queen Anne. Witness the hipped roofs and E plan along with sundry modified classic details in houses built between 1700 and 1720. Some houses of this date, such as "Waterlot" Southampton, display shaped gable ends, a feature occasionally cited as indicative of Spanish influence. For convincing proof of its direct English descent as a Tudor survival one need seek no farther than Salford Hall, Warwickshire, Montacute House, Somersetshire, Rushton Hall, Northants, Holland House, Kensington, or a score of similar instances.

The Georgian phase in Bermuda was interpreted according to limitations of the materials. The soft, fragile

rock coral was an unsuitable medium for the execution of capitals, pillars, pilasters, cornices, or finely detailed projections of any sort. A great deal of customary Georgian exterior ornament, therefore, had either to be drastically modified or altogether omitted, characteristic detail of the period being reserved chiefly for indoors. "Bloomfield" in Paget, built about 1760 or 1765, is a representative example of the Bermuda Georgian house. Here the projecting moulded corners, instead of pilasters or quoins, the rustication of the round-arched doorway, the fanlight, the hipped roof, and the generally symmetrical and formal plan with flanking wings, sufficiently attest Georgian provenance without resorting to the interior for more explicit identification. The absence of a cornice is characteristic of Bermuda for reasons already noted. "Bloomfield" is washed with salmon-pink; many other houses of the same period are similarly colored or are given a buff, yellow, brown, or gray wash. Some of the earlier houses also are color-washed, but not so commonly.

The immediate pertinence in examining Bermudian architecture is this. There is just now an urgent demand for simplification and moderate cost in moderate-sized houses. Bermudian houses, especially those of the pre-

Georgian types, are sufficiently simple in plan and lend themselves to an economical programme of construction. At the same time, they possess an eminent degree of architectural interest and dignity along with their straightforward simplicity. The sense of interior amplitude in some of these one-floor houses is greatly enhanced by the "tray" ceilings which extend into the height of the roof.



"Dorchester house," Paget; built c. 1765. North front. Bermudian Georgian.

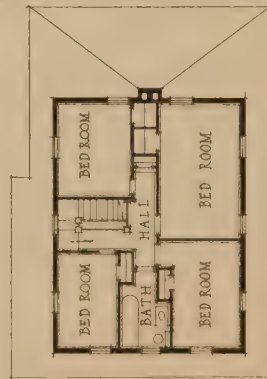
Without counselling any exact reproduction, one must nevertheless admit that Bermudian architecture is pregnant with suggestions that might readily be applied to stucco upon hollow tile or upon metal lath construction, and that it makes an infinitely stronger appeal than some of the modes often expressed in those media.



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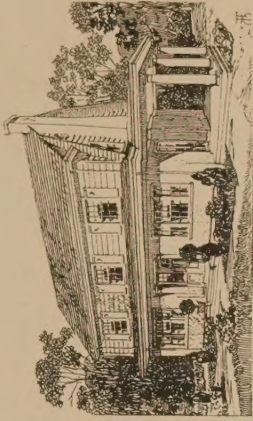
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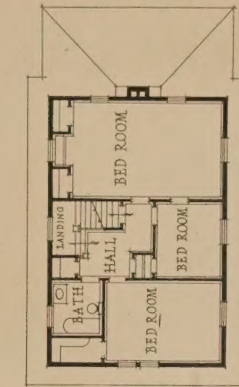
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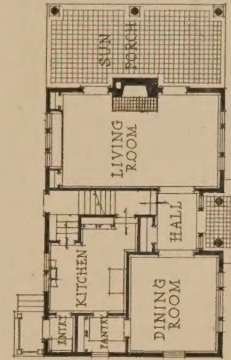
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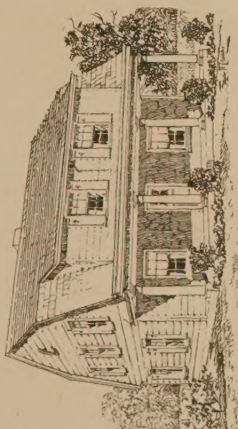
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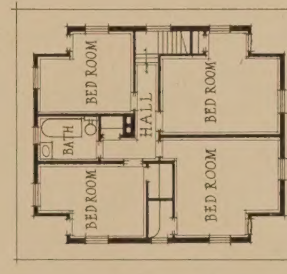
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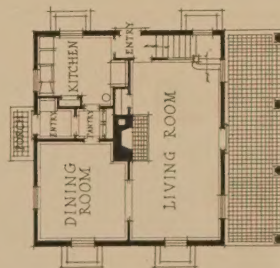
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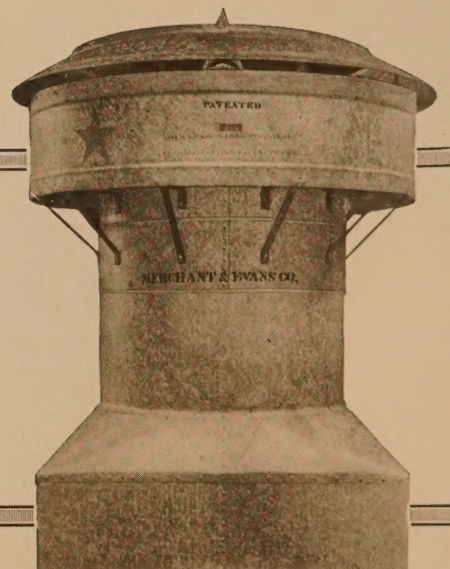
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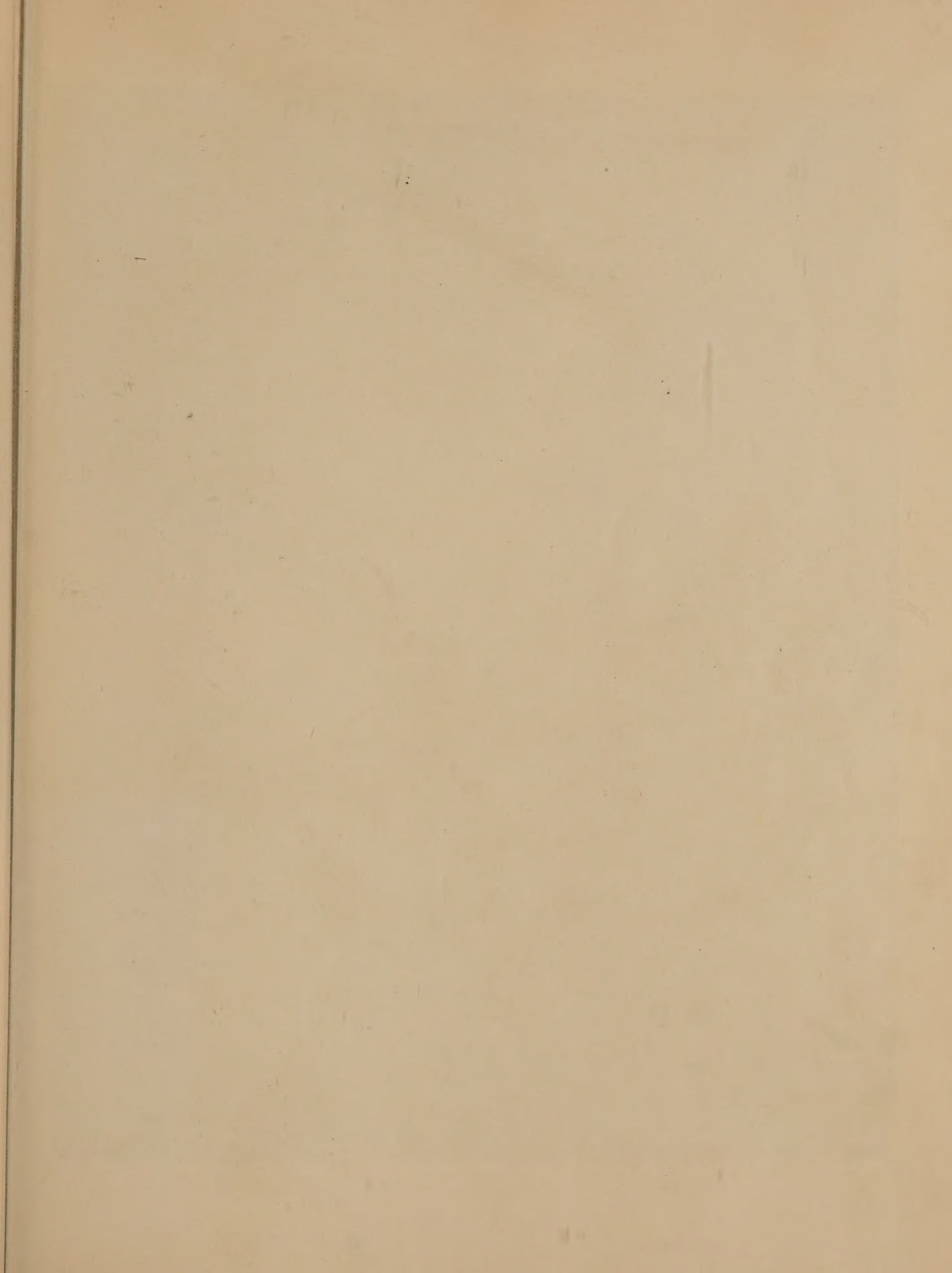
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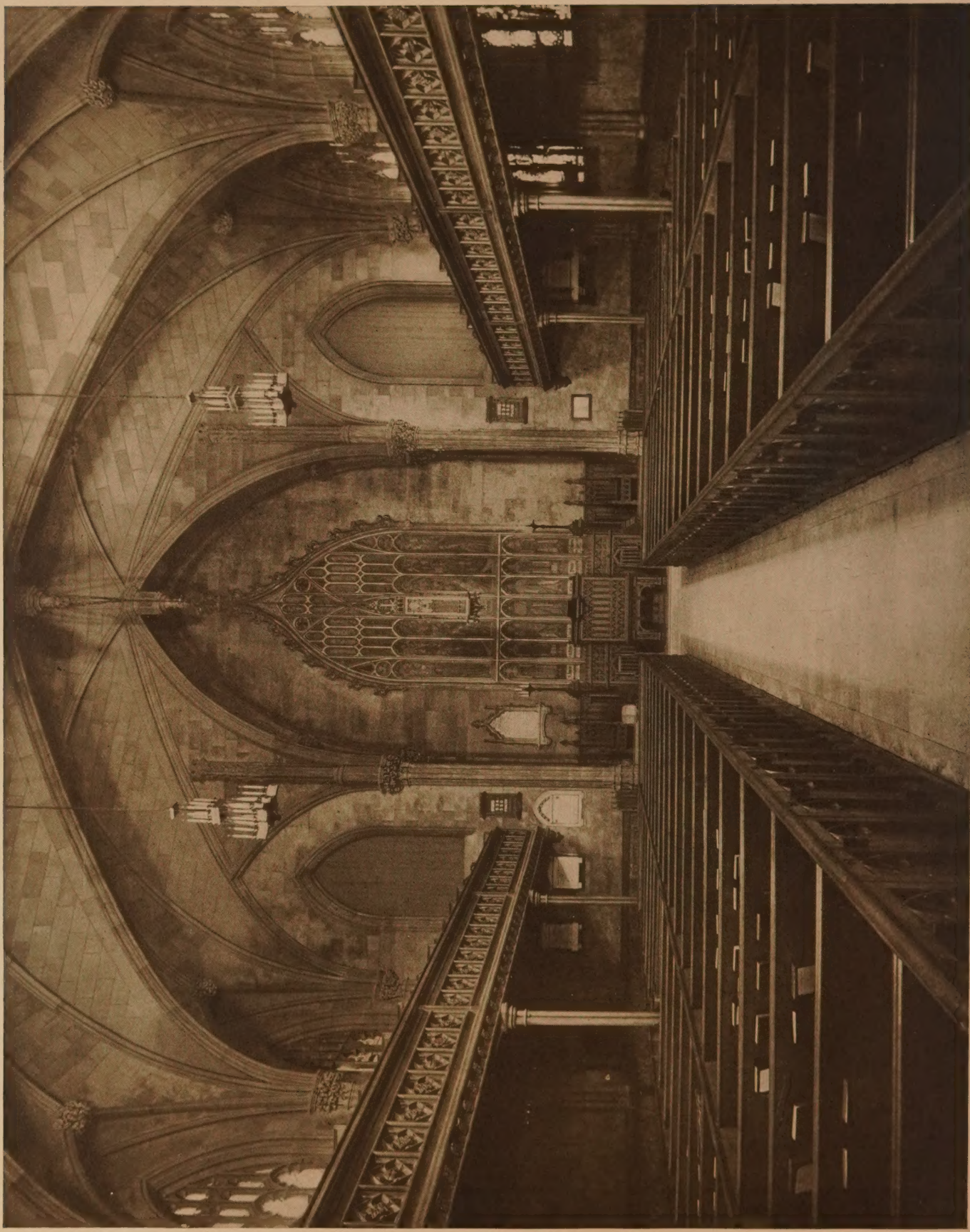
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